IBSN 0-7743-6710-5

ACIDIC PRECIPITATION IN ONTARIO STUDY

AN INTERCOMPARISON STUDY OF THREE PRECIPITATION SAMPLING NETWORKS IN ONTARIO - APOS, CANSAP AND GLPN

ARB-002-81-ARSP

Ministry of the Environment

Ontario

The Honourable
Keith C. Norton, Q.C.,
Minister

Gérard J. M. Raymond
Deputy Minister

ACIDIC PRECIPITATION IN ONTARIO STUDY
Coordinator: E.W. Piche
Ontario Ministry of the Environment
6th Floor, 40 St. Clair W.
Toronto, Ontario
Canada M4V 1P5

AN INTERCOMPARISON STUDY OF THREE PRECIPITATION SAMPLING NETWORKS IN ONTARIO - APOS, CANSAP AND GLPN

R.J. Vet
Concord Scientific Corporation
2 Tippett Road
Toronto, Ontario M3H 2V2

and

W.H. Chan and M. A. Lusis
Air Resources Branch
Ontario Ministry of the Environment
880 Bay St., 4th Floor
Toronto, Ontario M5S 1Z8

Report Number ARB-002-81-ARSP

September, 1981

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

Appendices

LIST OF TABLES

Acknowledgements

Appreciation is extended to the Atmospheric Environment Service (AES) and the Canadian Centre for Inland Waters (CCIW) for making this study possible. In particular, thanks are due to Dr. D. Whelpdale, Messrs. R. Berry and M. Still of AES and Messrs. D. Warry and C.H. Chan of CCIW.

Thanks are also due to all of the field personnel of AES, CCIW and MOE without whom the study could not have been completed. Special note should be given to Mr. K. Speicher who was responsible for the installation and operation of the APOS samplers, Mr. R. Chiu for maintaining the data base, Mr. R. Pilkey for developing the statistics computer programs, and J. Lam for running the computer programs.

Summary

An intercomparison study of the different sampling methodologies employed by the Acidic Precipitation in Ontario Study (APOS) Cumulative Precipitation Sampling Network, the Canadian Network for Sampling Precipitation (CANSAP), the Great Lakes Precipitation Network (GLPN) was carried out from June 1979 to April 1980. The study was designed to test the equivalence of the sample collection, handling and chemical analysis of the precipitation samples obtained from these networks. Its overall objective was to determine whether data obtained from the CANSAP and GLPN are compatible with data from the APOS network (scheduled to begin in the fall of 1980), and therefore suitable for inclusion in the final APOS data analysis.

Ten precipitation monitoring sites across Ontario were chosen for the study. APOS instruments and sample collection methods were operated concurrently with the regular CANSAP and/or GLPN instruments and methods at these sites.

Statistical analysis of the network data indicated good precision within each of the three networks. For several parameters, data for the three networks were shown to be signifcantly different. However, it was shown that within the 95% confidence limits, data on volume, pH, SO_4 and NO_3 from the three networks can be pooled together for analysis purposes. Also, this study clearly illustrated the difficulties in merging data from three networks which have different siting criteria, collection periods and operational priorities, and hence it was recommended that the APOS network be designed independently of the CANSAP and GLP networks.

CONCLUSIONS

An eleven month intercomparison study of the APOS, CANSAP and GLP networks for monthly precipitation sampling was carried out in 1979 and 1980. Based on the operational data and a statistical analysis of the precipitation chemistry data, a number of conclusions can be drawn regarding the design of the APOS cumulative network and the compatibility of the APOS, CANSAP and GLP network data. The conclusions are as follows:

- The design of the APOS provincial network should be done independently of the other existing networks. It was clear that operational differences between networks made the reliance of one network on another network for data very questionable.

- Precision in measurements (sample collections and chemical analysis) were quite good for all three networks.

- Data obtained after January, 1980 (with the new sampling methodologies implemented) of the CANSAP network are more compatible with those of the APOS network.

- Data obtained from all three networks are not compatible for several parameters; however data from CANSAP after January, 1980 and GLP, for volume, pH, SO_4 and NO_3 are equivalent at the 95% confidence level, and can be used with the APOS data set for overall analyses of precipitation chemistry in Ontario. Historical data of SO_4 and NO_3 before January, 1980 for the CANSAP Network should be used with reservation.

Section 1

OPERATIONAL DESCRIPTION

1.1 INTRODUCTION

In June 1979 the Air Resources Branch of the Ontario Ministry of the Environment initiated a study for the intercomparison of data from several precipitation chemistry monitoring networks operating in the province. The study was carried out under the auspices of the Acidic Precipitation in Ontario Study (APOS). Its purpose was to test the compatibility of data obtained by three different networks, namely, the Canadian Network for Sampling Precipitation (CANSAP), the Great Lakes Precipitation Network (GLPN) and the just conceived APOS Cumulative Precipitation Sampling Network. The latter network was scheduled to begin operation in the following fiscal year (1980-81) and the results of the intercomparison study were to serve as a reference in the design of this network. It was hoped that the study would indicate whether the existing CANSAP and GLPN sampling locations could be used as building blocks for the APOS network or whether the APOS network should be designed independently of these other networks.

The study was carried out with the cooperation of the Atmospheric Environment Service (AES) and the Canadian Centre for Inland Waters (CCIW). The former agency operates the CANSAP network and the latter operates the GLP Network. Five existing CANSAP sites, four existing GLPN sites and one Ministry of the Environment (MOE) historical precipitation sampling site were chosen for the study. At each CANSAP or GLPN site, an APOS sampler was installed and operated using the APOS sampling methodology. The CANSAP and GLPN sites were operated as normal using their respective sampling methodologies. At the remaining MOE site, two of each network's instruments were installed and operated by MOE staff according to their respective sampling methodologies. This was designed to provide a measure of the precision of the individual network data as well as additional intercomparison data.

The study was originally planned to operate from June to December, 1979. However, it was extended to April 1980 because the CANSAP sampling procedures were changed in January 1980 and the need for additional data was indicated.

This section of the report provides a summary of the objectives, operations, operational results and conclusions based on the operation of the study. The resultant data, the statistical analyses and the associated conclusions are presented in Section 2 of this report.

1.2. OBJECTIVES AND RATIONALE

The Ontario Ministry of the Environment initiated the Acidic Precipitation In Ontario Study (APOS) in April 1979. As part of this study, the Air Resources Branch has been given the mandate to develop a precipitation sampling network--the objective of which is to measure the long-term wet deposition field of a number of chemical pollutants across Ontario. Under time and manpower constraints imposed on this program by the concurrent operation of the Sudbury Environmental Study, it was obvious that such a network could not be designed, implemented and maintained during fiscal year 1979-80. A decision was therefore made to dedicate the 1979 APOS program to obtaining background information for use in the future design and operation of the APOS network.

The most critical information required at that time was the compatibility of data from precipitation monitoring networks already operating in Ontario by other agencies. Such information was necessary to the design of the APOS network since the existence of samplers with compatible data in some areas of Ontario could reduce the number of samplers required in the APOS network. They could, in fact, act as building blocks for the new network.

The two major networks in operation in Ontario in 1979 were the Atmospheric Environment Service's CANSAP (Canadian Network for Sampling Precipitation) and the Canadian Centre for Inland Waters' GLPN (Great Lakes Precipitation Network). The former consisted of 11 samplers in Ontario and the latter consisted of 10. The locations of the individual samplers are given in Table 1-1 .

An inter-agency intercomparison study (hereafter referred to as the "intercomparison study") was conceived to test the compatibility of the CANSAP, GLPN and APOS data. The design of the study required the isolation of all factors affecting sample compatibility. These were considered to be the following: (1) sampler site selection criteria, (2) sample collection period, (3) instrumentation, (4) sample handling methods, and (5) chemical analysis. A brief description of the influence of these factors is given below. More specific details are discussed in a later section.

(1) Siting criteria for locating precipitation samplers are extremely important and can be subdivided into two categories, viz:

(a) Criteria for determining the general location of sites in order to fulfill network objectives. The following example illustrates this point. A network with the objective of measuring the influence of a specific pollution source (stack, urban area, etc) on precipitation chemistry will have different siting criteria and resultant data than a network designed to measure background precipitation chemistry.

(b) Criteria for evaluating the specific characteristics of sampling sites. This is not independent of the first category but is slightly more specific; that is, it refers to the fact that the objectives and general location of two separate networks can be similar but the acceptance of site specific characteristics which affect sample integrity can differ radically. For an extreme instance, two networks could be designed to sample background precipitation and have samplers located in remote areas. However, one network which accepted sites immediately adjacent to dirt roadways would have different results from another network which rejects such sites. There are many site specific factors which can affect sample integrity and a more detailed discussion is given elsewhere (1).

(2) Collection period has an obvious effect on network comparisons. For example, if two networks have collection periods of one month but one collects on the last day of the month while the other collects on the first day of the month, then the collected samples for the same month could differ.

(3) Instrumentation can seriously affect network results for a large number of reasons. Examples of this are: different instruments have different sensor response, different mechanical response, different aerodynamic characteristics, different collection efficiencies and different evaporative losses. Also, different vessels in which precipitation is collected can have different adsorption, desorption and collection efficiency characteristics for the chemical constituents of precipitation.

(4) Sample handling methods generally vary greatly from network to network. Factors such as cleaning and handling of collection vessels, sample transfer and storage techniques, sample shipping and sample submission procedures can have major effects on sample integrity and can therefore significantly affect data compatibility between networks.

(5) Laboratory analysis of precipitation samples is the final source of potential difference of networks data. Individual sources of error also include differences in techniques and methods used.

The design of the APOS intercomparison study was based on testing some, but not all, of these factors. These are discussed in detail in Section 1.3.2. Fortunately, the siting criteria, collection period, instrumentation and sample handling and laboratory analysis methods for the APOS network were known at the inception of the study. This was due to previous precipitation sampling experience gained by the Air Resources Branch in the Sudbury Environmental Study.

1.3 DESCRIPTION

1.3.1 Network Operations

An overview of the CANSAP, GLPN and APOS network operations is given below.

CANSAP NETWORK:

The CANSAP network (2) consists of 50 sampling locations across Canada. The 11 locations in Ontario are indicated in Table 1-1. The objective of the network is to document the seasonal and geographical variations in concentration and deposition of chemical species in precipitation across Canada. Most samplers are located at Atmospheric Environment Service surface weather observation stations which are generally close to airports or urban areas.

The instrumentation consists of Sangamo Type A Wet/Dry Deposition collectors. The collection vessel is a high density, black polyethylene bucket. To date, no gasket has been mounted on the underside of the hood covering the collection vessel. This often results in a poor seal between the hood and the collection vessel, providing a potential source of evaporation and contamination to the sample.

Sample handling techniques changed in January 1980. Prior to this date, samples were left to accumulate in the Sangamo collection vessel for one month. On the last day of the month the sample was removed. A 500 ml aliquot was transferred to a Nalgene bottle which was then shipped to Toronto for chemical analysis by Canada Post. The collection vessel was rinsed with distilled deionized water and returned to be used in the instrument.

As of January 1980, the sample was no longer left to accumulate in the Sangamo vessel. Every one or two days, the collected precipitation sample was emptied into a large Nalgene sample bottle and stored on-site in a refrigerator. The total sample accumulated over a month therefore represented a composite of all events which occurred during the period. An aliquot of this sample was taken

at the end of the month and mailed to Toronto.

For both periods, samples were received at the Atmospheric Environment Service in Toronto. After being logged, they were delivered to the Canadian Centre for Inland Waters in Burlington for chemical analysis. The analyses were for pH, conductivity, acidity, $SO_4^{=}$, NO_3^{-}, Cl^{-}, NH_4^{+}, Na^{+}, K^{+}, Mg^{++} and Ca^{++}. A special request was made during this study that all CANSAP samples be also analysed for total Kjeldahl nitrogen, total phosphorous Mn, Ni, Pb, V, Al, Cu, Fe, Cd and Zn. These are not regularly analysed for.

GLP Network:

The GLP Network (3) consists of 10 wet-only precipitation samplers located around the Great Lakes in Ontario. Sampler locations are given in Table 1-1. The objectives of the network are two-fold, namely (i) to establish the chemical composition of precipitation in the Great Lakes Basin and (ii) to estimate annual atmospheric deposition in the Great Lakes Basin. Most samplers are located on Government of Canada property.

The GLPN instrumentation consists of the same Sangamo Type A Wet/Dry Deposition Collectors. The collection vessel is made of high density white polyethylene. A rigid teflon gasket is mounted on the underside of the sampler hood.

Sample handling techniques were consistent throughout the entire study. On the first day of each month, the sample collection vessel is removed from the Sangamo and capped. It is replaced by a clean vessel brought from the laboratory. The sample (in its collection vessel) is transported to the Canadian Centre of Inland Waters for laboratory analysis. The analyses carried out are pH, conductivity, acidity, $SO_4^{=}$, NO_3^{-}, Cl^{-}, NH_4^{+}, Na^{+}, K^{+}, Mg^{++}, Ca^{++}, Cd, Cu, Fe, Pb, Ni, Zn, total Kjeldahl nitrogen, soluble P, total P and soluble Si.

APOS Cumulative Network:

The APOS network was not in operation at the time of the intercomparison. However, as mentioned earlier, all operational and chemical analysis methods of the network had been determined.

The objective of the APOS network is to measure the background, long-term, wet desposition field of various pollutants across Ontario.

Instrumentation in this network also consisted of Sangamo Type A wet/dry deposition collectors. Several modifications have been made to the standard factory model, namely:

1. A soft silicone gasket was attached to the underside of the covering hood. This gasket was designed to provide a tight seal around the collection vessel top, thereby minimizing evaporative losses and particulate contamination.
2. The wet side collection vessel was replaced by food-grade, high density, polyethylene bags. A new bag was inserted into the standard high density, black polyethylene bucket each month. This eliminated the need for washing containers and guaranteed a pristine collection vessel each month.
3. In the winter, the black polyethylene container vessels and inserted bags were replaced by similar ones roughly twice as long. This change was based on wind tunnel testing which indicated that snow retention efficiency could be improved using this method (4).

Sample collection was designed to be monthly and the samples were to be submitted to the Laboratory Services Branch of the Ministry of the Environment in the polyethylene bags. Chemical analysis was to be done for pH, acidity, conductivity, $SO_4^{=}$, NO_3^{+}, Cl^{-}, NH_4^{+}, Na^{+}, K^{+}. Mg^{++}, Ca^{++} total Kjeldahl nitrogen, total P, Fe, Cu, Ni, Pb, Zn, Al, Cd, Mn, and V. It should be noted that Fe, Cu, Zn and Al adsorbed to a significant extent on the polyethylene bags from the solution and therefore acid leaching to desorb these materials was necessary. Extensive laboratory experiments have been carried out and the acid-leach process with nitric acid has been found to be very effective in desorbing the trace metals from the bag surface.

1.3.2 Experimental Design

As mentioned earlier, the factors isolated as influential on sample integrity are: siting criteria, collection period, instrumentation, sample handling techniques and laboratory analysis. As a result of discussions between the participating agencies, it was decided that a side-by-side intercomparison should take place, i.e. APOS instruments should be placed at existing CANSAP and CCIW sampling sites. The intercomparison, therefore, does not study the effect of different siting criteria on data compatibility. It should be noted that many of the CANSAP and CCIW sites would not be included in the APOS network because of different siting criteria.

A decision was also made to carry out APOS collections simultaneously by with the CANSAP and CCIW collections. Thus, the study was designed to address the combined effect of only the following factors collectively on network compatibility: the instrumentation, the sample handling methods and the laboratory analysis. The results of the study were expected to show whether any significant difference existed between networks for these factors. The study would ultimately indicate which existing monitors could provide compatible data for the APOS network if the siting criteria were matched.

A total of 10 sites were chosen for the study. Five sites were from the CANSAP network, viz. Pickle Lake, Atikokan, Simcoe, Kingston and Dorset. Four sites were from the GLP Network, viz. South Baymouth, Wiarton, Long Point and Woodbridge. The final site was located at the Ministry of the Environment-Sudbury Environmental Study precipitation monitoring site at Burwash. This site was chosen for a special study of precision of data from the three networks. Two instruments from each network were co-located and the samples from the collectors were handled according to the documented procedures for each network. The Sangamo samplers and manpower were provided by MOE but collection vessels and accessories were provided by AES and CCIW. Handling of all six samplers was

done by Sudbury Environmental Study staff. This was somewhat different than the other sampling sites which were maintained by the respective CANSAP or CCIW staff and by Ministry of the Environment regional personnel.

At all sampling locations, the sample handling procedures of the associated networks were strictly followed. Communication was set up between the MOE, AES and CCIW staff in an attempt to synchronize sampling periods. Sample submission procedures compatible with the respective organizations were determined for the Burwash CANSAP and GLPN samples and these samples were also analysed at the CCIW laboratory. Burwash APOS samples were analysed by the MOE Laboratory Services Branch.

The CANSAP and CCIW sites chosen for the intercomparison were determined from a consensus of all agencies. An attempt was made to choose sites from all across the province and with a wide range of site-specific characteristics. For instance, Pickle Lake and Atikokan were chosen to represent Northern Ontario but the former site was located well away from local sources while the latter was located in a town, near well-travelled roads and near a point source.

1.3.3 Site Descriptions

Brief descriptions of the intercomparison sites are given in Appendix 1-1. It is hoped that such background information will add clarity in evaluating the results of the study. Some descriptions are necessarily brief because of lack of information at the time of writing.

1.3.4 Operational Summary

The operation of the intercomparison can be subdivided into the routine operation of the CANSAP and GLP Networks as well as the supplemental APOS operations. In general, all operations ran smoothly with a reasonable number of problems. However, the APOS Sangamo instruments were plauged by an unusually high breakdown rate in the first several months of operation resulting in the relatively high loss of samples during that period. This was attributed to tightness in the mechanical parts of these new samplers.

Tables 1-2 to 1-12 summarize the operation of the study from June 1979 to April 1980.

1.4 DISCUSSION

The intercomparison study was designed to test the compatibility of the precipitation chemistry data obtained from the three networks. It was based on the hypothesis that if the chemistry data were compatible from network to network, then the future APOS network could reduce the number of samplers in areas where other networks' samplers already existed. Inherent in this was the assumption that only those external agency samplers which were located at sites meeting APOS site selection criteria would be used.

As the study progressed, it became increasingly apparent that factors other than the compatibility of the chemistry data were important to the outcome of the study. While such factors were anticipated at the inception of the study, their significance was not.

This discussion focuses solely on operational factors affecting the study outcome, i.e. network operations and APOS design inadequancies. Both of these factors were significant enough to provide preliminary conclusions from which the initial design of the APOS network was made.

Network Operations

The organization of the three networks was somewhat similar in that design and operations were controlled from Toronto. In the case of APOS, all installations, repairs and directions originated in Toronto. Actual sample collections were carried out by MOE Technical Support personnel provided by the respective MOE regions.

The CANSAP and GLPN operational procedures were somewhat different. Sample collections for the CANSAP network were carried out by on-site weather

observers while collections for the latter network were carried out by either on-site or Toronto-based personnel, depending on the location.

Considering the geographical spread of all three networks, typical breakdown rates of samplers, logistical difficulties in carrying out simultaneous collections and typical data reporting efficiencies, it is very easy to conceive of network compatibility problems. Each of these topics is discussed in turn.

1. Geographical Spread

   The large geographical areas covered by all networks (especially the CANSAP network) add significantly to operational difficulties. Communications, instrument repair, quality control, and implementation of network changes are several of the factors affected by this problem and all three networks exhibited them. This was particularly noticeable for APOS because lines of communication crossed so many different regions.

2. Sampler Breakdown Rates

   Typical sampler breakdown rates for similar networks are roughly 10% (this was the case, for example, in the Sudbury Environmental Study Precipitation Network). For the CANSAP, CCIW and APOS networks, this meant that, on average, one out of ten samplers would malfunction in a given month. For the APOS network, this was even higher because of problems encountered with the new instruments. This problem was exacerbated when malfunctions occurred at sampling locations remote from Toronto because sample repair was more difficult.

3. Simultaneous Sample Collection Difficulties

   For the purpose of the intercomparison study, APOS field personnel were instructed to contact their AES and CCIW counterparts before the end of each

month in order to synchronize sample collection dates at each sampling site. Tables 1-2 to 1-12 indicate that, even though this was done, many discrepancies occurred. This was due, in general, to difficulties in carrying out planned collections because of logistical problems, eg. snowstorms, higher priority work, operator illness. When one reviews Tables 1-2 to 1-12 bearing in mind that the CANSAP desired sample collection date is the last day of each month and the GLPN desired collection date is the first day of each month, the logistical difficulties become clearer, i.e. the collection dates for each network often deviated considerably from the desired date. The large variability within networks makes it extremely difficult to eliminate between-network variability. It became increasingly obvious during the course of the study that compatibility of networks' sampling periods was extremely difficult to achieve.

4. Network Data Reporting Efficiencies

The efficiency of reporting data for any network is related to many factors. The most significant of these are instrument malfunction (discussed earlier), sample collection and handling procedures, shipping procedures, laboratory handling and analysis methods and data handling procedures. Any one of these factors can reduce the accuracy of the data and/or invalidate the data completely. The result is a decrease in network data reporting efficiency.

A summary of the efficiency of the CANSAP Ontario stations is given in Table 1-13. It indicates that the average efficiency of reporting data from January 1978 to December 1979 was 78%. It can also be seen that the efficiency decreased rather significantly during the winter period. As another example, the overall efficiency of the Sudbury Environmental Study Precipitation Network was comparable to that of the CANSAP network at 85% (5).

These numbers infer that, even when data from more than one network are totally compatible, combining the data from these networks can result in incomplete data since no network operates on a 100% data recovery basis. If the conditions are less than ideal, i.e. different data recovery efficiencies, for each network, different efficiencies at different times of year, different collection periods and different sampling methodologies, then the number of occasions when complete network data will be available is expected to be very small.

In light of the foregoing discussion, the intercomparison study was a very useful project. It pointed out, dramatically, the problems encountered in attempting to operate a number of networks in a logistically compatible manner. The results are even more significant when one considers that the sampling periods for this study were designed to be simultaneous. In actual operation, the APOS network will be designed to have different sampling periods than the CANSAP and/or GLP Networks. This further complicates the synthesis of the data in a compatible form. (This problem is only significant for combining data on a monthly basis-if the data are to be combined on a seasonal or annual basis, the problem is reduced).

The combination of all the factors discussed produced two preliminary conclusions, namely:

(1) The organization, operation and instrumentation of the APOS sampling program required modifications to be adapted for use in the future APOS network. A brief discussion of the shortcomings and planned improvements are given in Appendix 1-2.

(2) Logistical and operational differences between networks indicate that the APOS network should be designed independently of the CANSAP and CCIW networks. This is because the three networks have different siting criteria, collection periods and operational priorities. All of these factors make it difficult for networks to rely on each other but allow each network to operate well within itself.

Because of time and manpower constraints, the province-wide APOS Cumulative Precipitation Sampling Network was designed before full analysis of the study results could be completed. The conclusions presented in this section were therefore used in the network design (early 1980). The network was installed in the summer of 1980 and began operation in September 1980.

Section 2

STATISTICAL ANALYSIS OF DATA

2.1 INTRODUCTION:

The main purpose of the intercomparison study is to examine whether sampling results obtained by the APOS, CANSAP and GLP networks are compatible. The study was designed to look at the combined results of sampling methodology and laboratory analysis rather than the individual factors. Also due to potential site specificities, a wide range of sampling sites was used so that any local characteristics may be averaged out in the overall analysis.

Before the statistical analysis is presented, it is useful to recall that data from all networks are over one-month periods. The Sangamo wet-only samplers were left in the field for the entire interval and efforts were made to pick up the samples from the two networks (APOS and CANSAP or APOS and GLPN) being compared on the same day. Because of uncontrollable circumstances, sometimes it was not possible. However, if no precipitation occurred over the non-overlapping days, meaningful comparisons could still result. All sampling data are given in Appendices 2-1 to 2-3 for the APOS, CANSAP, and GLP networks. If precipitation fell on the non-overlapping days, the samples are labelled with a symbol "+" and are excluded in the comparison. At times, there were sampling problems and some samples from one or more networks were not available. This resulted in missing data pairs for meaningful comparison. Samples without appropriate matching data pairs are labelled with a symbol "+" also. It should be noted again that as of January, 1980, the CANSAP network has modified its sampling procedures; instead of collecting one sample at the end of the sampling period, event samples over one or two days are transferred to a storage bottle and at the end of the month these sub-samples form a composite monthly sample for chemical analysis.

2.2 STATISTICAL ANALYSIS

Due to the limited data available and in order to take into account the potential site specificities, data from all stations of each individual network were combined together in the statistical analysis. In order to eliminate seasonal effects due to changing meteorology over the year, the paired-t test (pair-wise t-test) was performed on sample pairs collected from the two networks being compared over the same sampling periods.

Statistical analyses (95% confidence level) under the following grouping were examined.

1. Precision measurements at Burwash
   a. APOS
   b. CANSAP
   c. GLPN
2. Comparison of APOS and CANSAP Data
   a. Overall
   b. Summer operation (May - Oct.): primarily rain collection
   c. Winter operation (Nov. - Apr.): rain and snow collection
   d. Results collected before the end of December of 1979: Old CANSAP sampling methodology.
   e. Results collected after the beginning of January 1980: New CANSAP sampling methodology.
3. Comparison of APOS and GLPN Data
   a. Overall
   b. Summer operation (May - Oct.) : primarily rain collection
   c. Winter operation (Nov. - Apr.) : rain and snow collection
4. Comparison of GLPN and CANSAP Data at Burwash
   a. Overall
   b. Summer operation (May - Oct.) : primarily rain collection
   c. Winter operation (Nov. - Apr.) : rain and snow collection
   d. Data collected before the end of December of 1979: Old CANSAP sampling methodology.

e. Data collected after the beginning of January of 1980: New CANSAP sampling methodology.

2.3 RESULTS AND DISCUSSION

Not all the data shown in Appendices 2-1 to 2-3 are used in the statisical analysis. Aside from the fact that some sampling periods were not matching and some sampling problems were encountered, it should be pointed out that in the first month of the APOS operation, the normal APOS procedures were not used in that the precipitation was collected into the Sangamo polyethylene bucket rather than the polyethylene bag insert. As a result of this, there might be adsorption of trace metals onto the container surface. Also in the month of December, 1979 when the summer operation procedures were changed to winter procedures, two polyethylene bags (short and long) were used. The sample was transferred from one to the other, and this might create contamination problems. Therefore data from the above two months were not included in the statistical analyses.

2.3.1 Precision Measurements

During the intercomparison study period, two identical samplers from each one of the three networks were operated by MOE staff at Burwash according to the sampling procedures of each of the networks. This served a two-fold purpose; i.e. to provide additional data and to yield information regarding precision.

The paired - t test was performed on the samples collected from the same network over the same sampling periods. Except for the months of June and July, 1979, all data pairs obtained from the same network were used in the precision estimate. However, it should be pointed out that some of these were discarded in the inter-network comparisons described in sections 2.3.2 to 2.3.4 because of inconsistencies in sampling periods and methodologies. Details of the analysers are given in Appendices 2-4 to 2-6 for the APOS, CANSAP and GLP networks respectively. In all cases, a hypothesis that the two sample sets are from the same population is tested at the 95% confidence level. "T" refers to "true" and "F"

refers to "false" hypothesis. A summary of the qualitative results is given in Table 2-1.

It is noted that at the 95% confidence level, the overall measurements from the APOS network suggest good precision whereas for the CANSAP and GLP networks, pH and Fe are exceptions respectively. If the analysis is focused in the summer operation (May-October), APOS network volume parameter does not have good precision. In the winter operation (November-April), CANSAP network does not have satisfactory precision for pH measurements.

These results should be borne in mind when analyses presented in the following sections are examined. Care should be exercised in interpreting the summer data as in most cases, only three data pairs are included in the calculations.

2.3.2 Comparison of APOS and CANSAP Data

A detailed comparison of the data is given in Appendix 2-7 and a summary of the key results are given in Table 2-2. The data have been grouped into five different combinations to examine the overall network equivalence: summer operation (May-October), winter operation (November-April) and operations before and after the change over to the new sample collection procedures referred to in section 2.1 as of January, 1980. Parameters with no statistically significant difference at the 95% level are labeled "T", whereas for those described as "F+ve", APOS data have significantly higher parameter values compared to CANSAP data, and for those labelled "F-ve" the reverse is true. Values in brackets refer to the degree of freedom, i.e. number of data pairs minus one. Among the parameters which show a statistically significant difference, except for acidity and Fe, APOS data are in general lower.

The discrepancy of total acidity values measured in the two networks is probably due to the fact that the chemical analysis techniques are different. That most of the other parameters have lower concentrations in the APOS network

might indicate higher evaporative losses or dry contamination in the CANSAP network, which has no gasket on the Sangamo sampler cover. The consistently higher concentrations of Ca, K, Na, Mg, which are soil-related confirm this. This point is further supported indirectly by the fact that after the January, 1980 operational changes were implemented, the two data sets from APOS and CANSAP are more compatible (this could also reflect the reduction of dry contribution due to snow cover in the winter months). Conductivity is a reflection of the extra ionic species in the CANSAP samples. The consistently higher APOS Fe concentration is probably due to the fact that acid leach of the sampling vessel is performed in the APOS network but not in the CANSAP network to desorb the Fe loss to the surface.

It is worth noting that, despite the discrepancies observed in the soil-related species, overall results for Volume, pH, $N\text{-}NH_4$, TKN, TP, Ni, Pb, Zn, Al, Cd and Mn are quite comparable within statistical limits. However both SO_4 and NO_3 are not compatible with the CANSAP values being higher. Though inconclusive, there is some indication that with the switch in CANSAP methodology since January, 1980, the comparison between APOS and CANSAP data is better, suggesting perhaps CANSAP evaporative losses and/or dry contamination have been reduced at least in the winter months..

2.3.3 Comparison of APOS and GLPN Data

The qualitative comparison results are given in Table 2-3 and the details are given in Appendix 2-8. Cu values are consistently lower in the APOS collection and this may be due to contamination in the CCIW sample bottles (personal communication by C.H. Chan of CCIW). The argument for acidity and Fe discrepancies in the APOS/CANSAP data set applies also here. $N\text{-}NH_4$, Ni and Pb are higher in the APOS network and the reason is unclear.

Excluding acidity and Cu, in the summer operation, the APOS network has higher values in the following parameters compared to GLP network-pH, Ca, Mg, Fe, Ni and Pb. The higher pH may be a result of higher Ca and Mg. In the winter

operation, the APOS network has lower values of Cl and Ca but higher values of Fe and Ni. The above results which are inconsistent in the summer and winter are not easily explainable.

It is important to note that the overall results suggest that data on volume, pH, SO_4, NO_3 and some other major ions are statistically equivalent at the 95% level and could be used together for data interpretation.

2.3.4. Comparison of GLPN and CANSAP Data

The comparison of data from these two networks is limited to data from only one site-Burwash.

The qualitative summary is given in Table 2-4 and the details are given in Appendix 2-9.

In general, the CANSAP samples have more soil-related materials, e.g., K, Na and Mg and this in turn affects the pH value. Data on trace metals could be higher or lower depending on the species and there is no definite trend.

Overall results suggest that volume is less for the GLP network, but results of SO_4 and NO_3 are comparable.

References

1. Vet, R.J. and W.H. Chan, "The Acidic Precipitation in Ontario Study (APOS) Cumulative Precipitation Sampling Network" ARB interal report. August, 1980.

2. Berry, R.L., "The Canadian Network for Sampling Precipitation (CANSAP)" Internal Report ARQA 45-77, Atmospheric Chemistry, Criteria and Standards Division, Atmospheric Environment Service (1977).

3. Chan, C.H., Personal Communication.

4. Haasz, A.A. and D. Solomon, "Wind Tunnel Simulation Studies of Snow Collector Gauges" ARB Research Grant report submitted by the Institute for Aerospace Studies, University of Toronto, Downsview, Ontario (1980).

5. Unpublished ARB results.

TABLE 1-1

LOCATIONS OF EXTERNAL AGENCY PRECIPITATION CHEMISTRY SAMPLERS

AES-CANSAP	CCIW-GLPN
Trout Lake	Sibley Provincial Park
Pickle Lake	Batchawana
Atikokan	South Baymouth
Wawa*	Wiarton
Moosonee	Woodbridge
Kingston	Goderich
Peterborough	Pelce Island
Mount Forest	Niagara-on-the-Lake
Simcoe	Burlington
Windsor+	Trenton
Dorset	

* Moved to Kapuskasing in 1979

+ Moved to Harrow in 1980

TABLE 1-2

APOS INTERCOMPARISON OPERATIONAL SUMMARY

MONTH: JUNE 1979

STATION	APOS COLLECTION INTERVAL	CANSAP/CCIW COLLLECTION INTERVAL	COMMENTS
ATIKOKAN (CANSAP)	May 31 - July 3	May 31 - June 30	No rain between 31 May and 30 June but APOS instrument operation erratic Questionable comparison.
DORSET (CANSAP)	Not in Operation	Not in Operation	No comparison.
KINGSTON (CANSAP)	May 31 - June 30	May 31 - June 30	APOS sampler blew several fuses. No comparison.
PICKLE LAKE (CANSAP)	May 31 - July 2	May 31 - July 2	Good comparison.
SIMCOE (CANSAP)	NOT IN OPERATION	June 1	No comparison.
BURWASH (CANSAP/ CCIW)	May 30 - June 29	May 30 - June 29	Questionable comparison; Proper gaskets not installed.
LONG POINT (CCIW)	NOT IN OPERATION	June 13 - July 6	No Comparison.
SOUTH BAYMOUTH (CCIW)	June 1 - June 29	June 1 - July 1	APOS sampler blew several fuses. No comparison.
WIARTON (CCIW)	NOT IN OPERATION	June 1 - July 3	No comparison.
WOODBRIDGE (CCIW)	June 1 - June 29	May 31 - June 29	No precipitation May 31 - June 1. Good comparison.

NOTE: APOS sample collection bags had not arrived for this month's sampling so ordinary black polyethylene collection vessels were used.

TABLE 1-3

APOS INTERCOMPARISON OPERATIONAL SUMMARY

MONTH JULY 1979

STATION	APOS COLLECTION INTERVAL	CANSAP/CCIW COLLECTION INTERVAL	COMMENTS
ATIKOKAN (CANSAP)	July 3 - July 31	June 30 - July 31	No rain between June 30 and July 3. Good comparison.
DORSET (CANSAP)	June 30 - July 31	July 13 - July 31	11 mm precipitation between June 30 and July 13. No direct comparison.
KINGSTON (CANSAP)	June 30 - July 31	June 30 - July 31	Good Comparison.
PICKLE LAKE (CNASAP)	July 2 - July 31	July 2 - July 31	APOS sample damaged during shipment. Some volume lost. Reasonable chemistry comparison.
SIMCOE	July 1 - July 31	July 1 - July 31	Good Comparison.
BURWASH (CANSAP/ CCIW)	June 29 - July 30	June 29 - July 30	Questionable Comparison Proper gaskets not installed.
LONG POINT (CCIW)	July 9 - July 31	July 6 - July 30	No precipitation from July 6-9. Good comparison.
SOUTH BAYMOUTH (CCIW)	INSTRUMENT DOWN	July 1 - August 1	No Comparison.
WIARTON (CCIW)	July 1 - July 31	July 3 - August 3	0.3 mm precipitation on July 2. Questionable comparison.
WOODBRIDGE (CCIW)	June 29 - July 31	June 29 - July 31	APOS sampler malfunctioned. No comparison.

TABLE 1-4

APOS INTERCOMPARISON OPERATIONAL SUMMARY

MONTH: AUGUST 1979

STATION	APOS COLLECTION INTERVAL	CANSAP/CCIW COLLECTION INTERVAL	COMMENTS
ATIKOKAN (CANSAP)	July 31 - August 31	July 31 - August 31	APOS sample lost in transit. No comparison.
DORSET (CANSAP)	July 31 - Sept. 1	July 31 - August 31	APOS Instrument down. No comparison.
KINGSTON (CANSAP)	July 31 - Aug. 31	July 31 - August 31	APOS Instrument down. No comparison.
PICKLE LAKE (CANSAP)	July 31 - Sept. 1	July 31 - Sept. 1	APOS sample lost in transit. No comparison.
SIMCOE (CANSAP)	July 31 - August 31	July 31 - August 31	CANSAP samples observed to have unheated sensors. Good comparison.
BURWASH (CANSAP/ CCIW)	July 30 - August 30	July 30 - August 30	Good comparison.
LONG POINT (CCIW)	July 31 - Sept. 5	July 30 - Sept 5	Good comparison.
SOUTH BAYMOUTH (CCIW)	August 2 - August 31	August 1 - August 31	Good comparison.
WIARTON (CCIW)	July 31 - August 31	August 3 - Sept. 6	No comparison.
WOODBRIDGE (CCIW)	July 31 - August 31	July 31 - Aug. 30	Good comparison.

TABLE 1- 5

APOS INTERCOMPARISON OPERATIONAL SUMMARY

MONTH: SEPTEMBER 1979

STATION	APOS COLLECTION INTERVAL	CANSAP/CCIW COLLECTION INTERVAL	COMMENTS
ATIKOKAN (CANSAP)	August 31 - Sept. 30	August 31 - Sept. 30	Good comparison.
DORSET (CANSAP)	Sept. 1 - Oct. 1	Aug. 31 - Sept. 30	Good comparison.
KINGSTON (CANSAP)	Aug. 31 - Sept. 30	August 31 - Sept. 30	Good comparison.
PICKLE LAKE (CANSAP)	Sept. 1 - Oct. 1	Sept. 1 - Oct. 1	Good comparison for chemistry, not volume.
SIMCOE (CANSAP)	Aug. 31 - Oct. 1	August 31 - Sept. 30	0.4 mm Oct. 1. Good comparison.
BURWASH (CANSAP/ CCIW)	Aug. 30 - Oct. 1	Aug. 30 - Oct. 1	Good comparison.
LONG POINT (CCIW)	Sept. 5 - Oct. 1	Sept. 5 - Oct. 1	Good comparison.
SOUTH BAYMOUTH(CCIW)	Aug. 31 - Oct. 1	Aug. 31 - Oct. 1	Good comparison.
WIARTON (CCIW)	Aug. 31 - Oct. 1	Sept. 6 - Oct. 1	8.8mm precipitation on Sept. 2. No comparison.
WOODBRIDGE (CCIW)	Aug. 31 - Sept. 28	Aug. 30 - Sept. 28	No precipitation during Aug. 30-31. Good comparison.

TABLE 1-6

APOS INTERCOMPARISON OPERATIONAL SUMMARY

MONTH: OCTOBER 1979

STATION	APOS COLLECTION INTERVAL	CANSAP/CCIW COLLECTION INTERVAL	COMMENTS
ATIKOKAN (CANSAP)	Sept. 30 - Oct. 31	Sept. 30 - Oct. 31	Good comparison.
DORSET (CANSAP)	Oct. 1 - Oct. 31	Sept. 30 - Oct. 31	APOS fuse blew. Questionable. comparison.
KINGSTON (CANSAP)	Sept. 30 - Nov. 1	Sept. 30 - Oct.31	No rain on Oct. 31-Nov. 1. Good comparison.
PICKLE LAKE (CANSAP)	No Sample	Oct. 1 - Nov. 1	No comparsion.
SIMCOE (CANSAP)	Oct. 1 - Oct. 31	Sept. 30 - Oct. 31	0 mm on Sept. 30 .4 mm on Oct. 1 Good Comparison.
BURWASH (CANSAP/ CCIW)	Oct. 1 - Oct. 31	Oct. 1 - Oct. 31	Good comparison.
LONG POINT (CCIW)	Oct. 1 - Nov. 1	Oct. 1 - Nov. 1	APOS Sampler malfunctioned. No comparison.
SOUTH BAYMOUTH (CCIW)	Oct. 1 - Oct. 31	Oct. 1 - Nov. 1	APOS sampler found uncovered. Questionable comparison.
WIARTON (CCIW)	Oct. 1 - Oct. 31	No sample-operator strike	No comparison.
WOODBRIDGE (CCIW)	Sept. 28 - Nov. 1	Sept. 28 - Nov. 1	Good comparison.

TABLE 1-7

APOS INTERCOMPARISON OPERATIONAL SUMMARY

MONTH: NOVEMBER 1979

STATION	APOS COLLECTION INTERVAL	CANSAP/CCIW COLLECTION INTERVAL	COMMENTS
ATIKOKAN (CANSAP)	Oct. 31 - Nov. 30	Oct. 31 - Nov. 30	Good comparison.
DORSET (CANSAP)	Oct. 31 - Nov. 30	Oct. 31 - Nov. 30	Good comparison.
KINGSTON (CANSAP)	Nov. 1 - Nov. 30	Oct. 31 - Nov. 30	No precipitation Oct. 31 - Nov. 1. Good comparison.
PICKLE LAKE (CANSAP)	NO SAMPLE	NO SAMPLE	No comparison.
SIMCOE (CANSAP)	Oct. 31 - Nov. 30	Oct. 31 - Nov. 30	Good comparison.
BURWASH (CANSAP/ CCIW)	Oct. 31 - Nov. 30	Oct. 31 - Nov. 30	Good comparison.
LONG POINT (CCIW)	Nov. 1 - Dec 3	Nov. 1 - Dec. 3	Good comparison. (Possible APOS limit switch problem).
SOUTH BAYMOUTH (CCIW)	Oct. 31 - Nov. 30	Nov. 1 - Nov. 30	0.6 mm on Oct.31 1.8 mm on Nov. 1 No direct comparison.
WIARTON (CCIW)	Oct. 31 - Nov.29	Oct. 31 - Nov. 29	Good comparison.
WOODBRIDGE (CCIW)	Nov. 1 - Nov. 30	Nov. 1 - Nov. 30	Good comparison.

TABLE 1-8

APOS INTERCOMPARISON OPERATIONAL SUMMARY

MONTH: DECEMBER 1979

STATION	APOS COLLECTION INTERVAL	CANSAP/CCIW COLLECTION INTERVAL	COMMENTS
ATIKOKAN (CANSAP)	Nov. 30 - Dec. 31	Nov. 30 - Dec. 31	APOS sample lost. No comparison.
DORSET (CANSAP)	Nov. 30 - Jan. 2/80	Nov. 30 - Jan 2/80	Good comparison.
KINGSTON (CANSAP)	Nov. 30 - Jan. 1/80	Nov. 30 - Dec. 31	No precipitation Dec. 30-Jan 1. Good comparison.
PICKLE LAKE (CANSAP)	No sample	No sample	No comparison.
SIMCOE (CANSAP)	No sample	Nov. 30 - Dec. 31	No comparison.
BURUASH (CANSAP/ CCIW)	Nov. 30 - Jan. 2/80	Nov. 30 - Jan. 2/80	Good comparison.
LONG POINT (CCIW)	Dec. 3 - Jan. 2/80	Dec. 3 - Jan 2/80	APOS sampler fuse blown. No comparison.
SOUTH BAYMOUTH (CCIW)	Nov. 30 - Dec. 31	Nov. 30 - Dec. 31	Good comparison.
WIARTON (CCIW)	Nov. 29 - Jan 7/80	Nov. 29 - Jan. 7/80	APOS Sangomo lid frozen. Questionable comparison
WOODBRIDGE (CCIW)	Nov. 30 - Dec. 31	Nov. 30 - Jan. 02	No precipation Dec. 31 to Jan. 02/80. Good Comparison.

TABLE 1-9

APOS INTERCOMPARISON OPERATIONAL SUMMARY

MONTH: JANUARY 1980

STATION	APOS COLLECTION INTERVAL	CANSAP/CCIW COLLECTION INTERVAL	COMMENTS
ATIKOKAN (CANSAP)	Dec.31/79-Jan.31/80	Dec.31/79-Jan.31/80	APOS sample leaked. No comparison.
DORSET (CANSAP)	Jan. 2 - Jan 31	Jan 2 - Jan 25	3mm on Jan. 27. No comparison.
KINGSTON (CANSAP)	Jan 1 - Feb. 1	Dec. 31/79 - Jan. 31/80	No precipitation Dec. 31-Jan. 1. Good Comparison.
PICKLE LAKE (CANSAP)	No sampling	No sampling	No comparison.
SIMCOE (CANSAP)	Jan 3 - Jan 31	Dec. 31 - Jan. 31/80	1.4 mm precipitation Jan. 2-3. No direct comparison.
BURWASH (CANSAP/ CCIW)	Jan. 2 - Jan. 30	Jan 2 - Jan 30	Good comparison.
LONG POINT (CCIW)	Jan 2 - Jan 31	Jan 2 - Feb 4	APOS Sangamo malfunctioned. No comparison.
SOUTH BAYMOUTH (CCIW)	Dec 31 - Feb 1	Dec. 31 - Feb 1	Good comparison.
WIARTON (CCIW)	Jan 7 - Jan 31	Jan 7 - Jan 31	APOS sample leaked. No comparison.
WOODBRIDGE (CCIW)	Dec 31 - Jan 31	Jan 2 - Feb 1	Good comparison.

TABLE 1-10

APOS INTERCOMPARISON OPERATIONAL SUMMARY

MONTH: FEBRUARY 1980

STATION	APOS COLLECTION INTERVAL	CANSAP/CCIN COLLECTION INTERVAL	COMMENTS
ATIKOKAN (CANSAP)	Jan. 31 - Feb. 29	Jan. 31 - Feb 29	Good comparison.
DORSET (CANSAP)	Jan. 31 - Mar. 5	No sampling	No comparison.
KINGSTON (CANSAP)	Feb. 1 - Feb. 29	Jan. 31 - Feb. 29	No precipitation Jan. 31 - Feb. 1. Good comparison.
PICKLE LAKE (CANSAP)	Feb. 15 - Mar. 4	Feb. 15 - Feb. 29	1.5 mm Mar. 3. No direct comparison.
SIMCOE (CANSAP)	Jan. 31 - Mar. 3	Jan. 31 - Feb. 29	No precipitation Feb. 29 - Mar. 3. Good comparison.
BURWASH (CANSAP/ CCIW)	Jan 30 - Feb. 28	Jan 30 - Feb 28	Good Comparison.
LONG POINT (CCIW)	Jan. 31 - Mar. 3	Feb. 4 - Mar. 3	Probably percipitation on Feb. 2. Questionable comparison.
SOUTH BAYMOUTH (CCIW)	No sampling	Feb. 1 - Mar. 1	No comparison.
WIARTON (CCIW)	Jan. 31 - Feb. 29	Jan. 31 - Feb. 29	Contamination from snow blower. No comparison.
WOODBRIDGE (CCIW)	Jan. 31 - March 6	Feb. 1 - Mar. 03	APOS sampler failed. No comparison.

TABLE 1-11

APOS INTERCOMPARISON OPERATIONAL SUMMARY

MONTH: MARCH 1980

STATION	APOS COLLECTION INTERVAL	CANSAP/CCIN COLLECTION INTERVAL	COMMENTS
ATIKOKAN (CANSAP)	Feb. 29 - Mar. 31	Feb. 29 - Mar. 31	Good comparison.
DORSET (CANSAP)	Mar. 5 - Mar. 31	Mar. 5 - Mar. 31	Good comparison.
KINGSTON (CANSAP)	Feb. 29 - Mar. 31	Feb. 29 - Mar. 31	No precipitation. Feb. 28 - 29 Good comparison.
PICKLE LAKE (CANSAP)	Mar. 4 - Apr. 9	Feb. 29 - Apr. 9	Problems with both samples No comparison.
SIMCOE (CANSAP)	Mar. 3 - Mar. 31	Feb. 29 - Mar. 31	No precipitation. Feb. 29 - Mar. 3. Good comparison.
BURWASH (CANSAP CCIW)	Feb. 28 - Mar. 31	Feb. 28 - Mar. 31	Good Comparison.
LONG POINT (CCIW)	No sampling	Mar. 3 - Apr. 01	No comparison.
SOUTH BAYMOUTH (CCIW)	No sampling	Mar. 1 - Mar. 31	No comparison.
WIARTON	Feb. 29 - Mar. 31	Feb. 29 - Apr. 2	
WOODBRIDGE	Mar. 6 - Mar. 31	Mar. 3 - Mar. 31	Precipitation on Mar. 5. No comparison.

TABLE 1-12

APOS INTERCOMPARISON OPERATIONAL SUMMARY

MONTH APRIL 1980

STATION	APOS COLLECTION INTERVAL	CANSAP/CCIW COLLECTION INTERVAL	COMMENTS
ATIKOKAN (CANSAP)	Mar. 31 - May 5	Mar. 31 - Apr 30	No APOS Data. No comparison.
DORSET (CANSAP)	Mar. 31 - Apr. 30	Mar. 31 - Apr. 30	Good comparison.
KINGSTON (CANSAP)	Mar. 31 - May 1	Mar. 31 - Apr. 30	Good comparison.
PICKLE LAKE (CANSAP)	Apr. 9 - May 15	Apr. 9 - May 15	Good comparison.
SIMCOE (CANSAP)	No sampling	Mar. 31 - Apr. 30	No comparison.
BURWASH (CANSAP/ CCIW)	Mar. 31 - Apr. 29	Mar. 31 - Apr. 29	Good comparison.
LONG POINT (CCIW)	No sampling	Apr. 01 - May 05	No comparison.
SOUTH BAYMOUTH (CCIW)	Mar. 31 - Apr. 30	Mar. 31 - May 01	Good comparison.
WIARTON (CCIW)	Mar. 31 - Apr. 30	Apr. 02 - Apr. 30	APOS sampler malfunctioned. No comparison.
WOODBRIDGE (CCIW)	Mar. 31 - Apr. 30	Mar. 31 - Apr. 30	Good comparison.

TABLE 1-13

SUMMARY OF CANSAP DATA REPORTING EFFICIENCIES

Year	Month	Number Stations Reporting Data	Number Stations in Operation	Efficiency
1979	December	10	12	0.83
	November	11	12	0.92
	October	12	12	1.00
	September	11	12	0.92
	August	11	11	1.00
	July	8	11	0.73
	June	8	10	0.80
	May	8	10	0.80
	April	7	10	0.70
	March	9	10	0.90
	February	6	10	0.60
	January	5	10	0.50
1978	December	6	10	0.60
	November	10	10	1.00
	October	10	10	1.00
	September	8	10	0.80
	August	10	10	1.00
	July	8	10	0.80
	June	8	10	0.80
	May	10	10	1.00
	April	6	10	0.60
	March	7	10	0.70
	February	2	10	0.20
	January	6	10	0.60
			Average Efficiency =	0.78

TABLE 2-1

SUMMARY OF INTERCOMPARISON DATA - BURWASH - PRECISION TEST+

	APOS			CANSAP			CCIW		
PARAMETER	O	S	W	O	S	W	O	S	W
Vol.	T(8)	F(2)	T(5)	T(8)	T(2)	T(5)	T(8)	T(2)	T(5)
Cond.	T(6)	T(2)	T(3)	T(8)	T(2)	T(5)	T(8)	T(2)	T(5)
pH	T(7)	T(2)	T(4)	F(7)	T(1)	F(5)	T(8)	T(2)	T(5)
Acidity	T(6)	T(2)	T(3)	T(8)	T(2)	T(5)	T(8)	T(2)	T(5)
SO_4	T(7)	T(2)	T(4)	T(8)	T(2)	T(5)	T(8)	T(2)	T(5)
$N\text{-}NO_3$	T(7)	T(2)	T(4)	T(8)	T(2)	T(5)	T(8)	T(2)	T(5)
$N\text{-}NH_4$	T(7)	T(2)	T(4)	T(8)	T(2)	T(5)	T(8)	T(2)	T(5)
Cl	T(7)	T(2)	T(4)	T(8)	T(2)	T(5)	T(8)	T(2)	T(5)
Ca	T(7)	T(2)	T(4)	T(8)	T(2)	T(5)	T(8)	T(2)	T(5)
K	T(7)	T(2)	T(4)	T(8)	T(2)	T(5)	T(8)	T(2)	T(5)
Na	T(7)	T(2)	T(4)	T(8)	T(2)	T(5)	T(8)	T(2)	T(5)
K-TKN	T(6)	T(2)	T(3)	N.D	N.D.	N.D.	T(8)	T(2)	T(5)
TP	T(6)	T(2)	T(3)	T(8)	T(2)	T(5)	T(8)	T(2)	T(5)
Mg	T(7)	T(2)	T(4)	T(8)	T(2)	T(5)	T(8)	T(2)	T(5)
Fe	T(6)	T(2)	T(3)	T(8)	T(2)	T(5)	F(7)	T(2)	T(4)
Cu	T(6)	T(2)	T(3)	T(8)	T(2)	T(5)	T(7)	T(2)	T(4)
Ni	T(6)	T(2)	T(3)	T(8)	T(2)	T(5)	T(7)	T(2)	T(4)
Pb	T(6)	T(2)	T(3)	T(8)	T(2)	T(5)	T(7)	T(2)	T(4)
Zn	T(6)	T(2)	T(3)	T(8)	T(2)	T(5)	T(7)	T(2)	T(4)
Al	T(6)	T(2)	T(3)	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Cd	T(3)	N.D.*	T(3)	T(8)	T(2)	T(5)	T(7)	T(2)	T(4)
Mn	T(6)	T(2)	T(3)	N.D.	N.D.	N.D	N.D.	N.D.	N.D.
V	T(6)	T(2)	T(3)	N.D.	N.D.	N.D.	N.D	N.D.	N.D.

+ T= true hypothesis, F= false hypothesis at 95% confidence limit;
Values in brackets correspond to degree of freedom
O = overall data set; S = summer data set; W = winter data set

* No data pairs

TABLE 2-2

SUMMARY OF INTERCOMPARISON DATA - APOS VS. CANSAP+

PARAMETER	OVERALL	MAY-OCT.	NOV.-APR.	JUN.-DEC.	JAN.- APR.
Vol.	T(31)	T(13)	T(17)	T(19)	T(11)
Cond.	F-ve(30)	F-ve(13)	T(16)	F-ve(19)	T(10)
pH	T(30)	T(12)	T(17)	T(18)	T(11)
Acidity	F+ve(26)	F+ve(13)	F+ve(12)	F+ve(19)	F+ve(6)
SO_4	F-ve(31)	F-ve(13)	T(17)	F-ve(19)	T(11)
$N\text{-}NO_3$	F-ve(30)	T(13)	F-ve(16)	F-ve(19)	T(10)
$N\text{-}NH_4$	T(30)	T(13)	T(16)	T(19)	F+ve(10)
Cl	F-ve(31)	F-ve(13)	F-ve(17)	T(19)	F-ve(11)
Ca	F-ve(29)	F-ve(13)	T(15)	F-ve(19)	T(9)
K	F-ve(30)	F-ve(13)	F-ve(16)	F-ve(19)	F-ve(10)
Na	F-ve(30)	F-ve(13)	F-ve(16)	F-ve(19)	F-ve(10)
N-TKN	T(16)	T(7)	T(8)	T(11)	T(4)
TP	T(29)	T(13)	F-ve(15)	T(19)	T(9)
Mg	F-ve(30)	F-ve(13)	F-ve(16)	F-ve(19)	F-ve(10)
Fe	F+ve(28)	F+ve(13)	F+ve(14)	F+ve(19)	F+ve(8)
Cu	F-ve(28)	F-ve(13)	T(14)	F-ve(19)	T(8)
Ni	T(28)	T(13)	T(14)	T(19)	T(8)
Pb	T(28)	T(13)	T(14)	T(19)	T(8)
Zn	T(28)	T(13)	T(14)	T(19)	T(8)
Al	T(15)	T(7)	T(7)	T(11)	T(3)
Cd	T(14)	N.D.	T(14)	T(5)	T(8)
Mn	T(15)	T(7)	T(7)	T(11)	T(3)
V	N.D.*	N.D.	N.D.	N.D.	N.D.

+ T= true hypothesis, F-ve = false hypothesis: APOS$<$CANSAP, F+ve = false hypothesis: APOS $>$ CANSAP at 95% confidence limit; values in brackets correspond to degree of freedom

* No data pairs.

TABLE 2-3

SUMMARY OF INTERCOMPARISON DATA - APOS VS. GLPN (CCIW)

PARAMETER	OVERALL	MAY-OCT.	NOV.-APR.
Vol.	T(27)	T(13)	T(13)
Cond.	F-ve(26)	T(13)	F-ve(12)
pH	T(26)	F+ve(13)	T(12)
Acidity	F+ve(23)	F+ve(13)	F+ve(9)
SO_4	T(26)	T(13)	T(12)
$N\text{-}NO_3$	T(26)	T(13)	T(12)
$N\text{-}NH_4$	F+ve(26)	T(13)	T(12)
Cl	F-ve(26)	T(13)	F-ve(12)
Ca	T(26)	F+ve(13)	F-ve(12)
K	T(26)	T(13)	T(12)
Na	T(26)	T(13)	T(12)
K-TKN	T(26)	T(13)	T(12)
TP	T(26)	T(13)	T(12)
Mg	T(26)	F+ve(13)	T(12)
Fe	F+ve(25)	F+ve(13)	F+ve(11)
Cu	F-ve(25)	F-ve(13)	F-ve(11)
Ni	F+ve(25)	F+ve(13)	F+ve(11)
Pb	F+ve(25)	F+ve(13)	T(11)
Zn	T(25)	T(13)	T(11)
Al	N.D.*	N.D.	N.D.
Cd	T(11)	N.D.	T(11)
Mn	N.D.	N.D.	N.D.
V	N.D.	N.D.	N.D.

+ T= true hypothesis, F-ve = false hypothesis: APOS$<$GLPN F+ve = false hypothesis: APOS$>$GLPN at 95% confidence limit; values in brackets correspond to the degree of freedom

* No data pairs.

TABLE 2-4

SUMMARY OF INTERCOMPARISON DATA (AT BURWASH SITE ONLY)*

GLPN (CCIW) vs. CANSAP

PARAMETER	OVERALL	MAY-OCT.	NOV.-APR.	JUN.-DEC.	JAN.-APR.
Vol.	F-ve(17)	T(5)	T(11)	T(9)	T(7)
Cond.	T(17)	T(5)	T(11)	T(9)	T(7)
pH	F-ve(16)	F-ve(4)	F-ve(11)	T(8)	F-ve(7)
Acidity	F+ve(17)	T(5)	F+ve(11)	T(9)	F+ve(7)
SO_4	T(17)	T(5)	T(11)	T(9)	T(7)
$N\text{-}NO_3$	T(17)	T(5)	T(11)	T(9)	T(7)
$N\text{-}NH_4$	T(17)	T(5)	T(11)	T(9)	T(7)
Cl	T(17)	T(5)	T(11)	T(9)	T(7)
Ca	T(17)	T(5)	T(11)	T(9)	T(7)
K	F-ve(17)	T(5)	T(11)	T(9)	T(7)
Na	F-ve(17)	T(5)	F-ve(11)	T(9)	F-ve(7)
N-TKN	N.D.*	N.D.	N.D.	N.D.	N.D.
TP	T(17)	T(5)	F-ve(11)	T(9)	F-ve(7)
Mg	F-ve(17)	T(5)	F-ve(11)	T(9)	T(7)
Fe	F+ve(15)	T(5)	F+ve(9)	F+ve(9)	F+ve(5)
Cu	F+ve(15)	T(5)	F+ve(9)	F+ve(9)	T(5)
Ni	T(15)	T(5)	T(9)	T(9)	T(5)
Pb	T(15)	T(5)	T(9)	T(9)	T(5)
Zn	F-ve(15)	T(5)	F-ve(9)	T(9)	F-ve(5)
Al	N.D.	N.D.	N.D.	N.D.	N.D.
Cd	F-ve(15)	F-ve(5)	F-ve(9)	F-ve(9)	F-ve(5)
Mn	N.D.	N.D.	N.D.	N.D.	N.D.
V	N.D.	N.D.	N.D.	N.D.	N.D

+ T= true hypothesis, F-ve = false hypothesis: GLPN<CANSAP, F+ve = false hypothesis: GLPN > CANSAP at 95% confidence limit; values in brackets correspond to the degree of freedom

* No data pairs.

6AR/3

Appendix 1-1

CANSAP, GLPN and MOE Site Descriptions

CANSAP Network

1. Pickle Lake

Latitude (N): 51° 28'

Longitude (W): 90° 12'

Elevation(m): 366 MSL

Location: AES Surface Weather Station

Description: The site is located on the west side of the town and on the South shore of Pickle Lake. It is surrounded by trees on two sides, the lake on another and buildings on the final side. Ground cover is gravel and grass and the site is on a downslope to the lake. No known pollution sources are in the area.

2. Atikokan:

Latitude (N): 48° 45'

Longitude (W): 91° 37'

Elevation(m): 393 MSL

Location: AES Surface Weather Station

Description: Property is located on the east side of the town of Atikokan. It is clear, level and grass covered. Located within 100 m of the station is a two-lane paved highway (11B) plus several local roadways. During the study, one of the local roads near the samplers was made of gravel. Also located near the site is a railroad track and a staff parking lot. Within several kilometers were the stacks of Steep Rock Iron Mines Limited and Caland Ore Limited iron ore pelletizing plants. Both these sources were responsible for significant emissions of dust. Steep Rock ceased production in August, 1979 and Caland closed its plant in April, 1980.

3. Kingston:

Latitude (N): 44° 13'

Longitude (W): 76° 36'

Elevation (m): 305 MSL

Location: AES Surface Weather Station, Kingston Airport

Description: The site is located at Kingston Airport to the west of Kingston. It is located on the shore of Lake Ontario.

4. Dorset:

Latitude (N): 45° 13'

Longitude (W): 44° 41'

Elevation (m): 320 MSL

Location: Ontario Ministry of the Environment Dorset Laboratory

Description: Sampler is located west of the town of Dorset in a clearing surrounded by trees. All trees are many heights away from the sampler. The ground cover is sand and grass. A dirt road approx. 50 m from site is separated from the sampler by a row of trees.

5. Simcoe:

Latitude (N): 42° 51'

Longitude (W): 80° 16'

Elevation (m): 240 MSL

Location: AES Surface Weather Station, Horticultural Experiment Station

Description: The site is surrounded by fruit orchards and woodlots. A railroad line exists approx. 800 m to the south. The property is located 4 Km ENE of the town of Simcoe

CCIW - GLP Network

1. South Baymouth

   Latitude (N): Not available

   Longitude (W): Not available

   Elevation (m): Not available

   Location: Fisheries Research Station

   Description: Sampler is located on the roof of a 2 story building on top of a hill. On the opposite side of the roof is a three flue chimney.

2. Wiarton:

   Latitude (N): Not available

   Longitude (W): Not available

   Elevation (m): Not available

   Location: Wiarton Airport

   Description: Sampler is located at the airport approx. 30 m from a 2 storey building. The airstrip is located on one side of the sampler, a downslope on the other.

3. Woodbridge:

   Latitude (N): Not available

   Longitude (W): Not available

   Elevation (m): Not available

   Location: AES Meteorological Research Station

   Description: Site is open, flat and grassy. Located northwest of Toronto with Hwy #7 approx 1 Km to the south, Weston Road approx. 0.5 Km to the east and a gravel driveway roughly 40m to the north.

4. Long Point:

Latitude (N): Not available

Longitude (W): Not available

Elevation (m): Not available

Location: Big Creek Wildlife Conservation Area

Description: Sampler is located on Long Point Peninsula in the yard of the Conservation Area office. The site is clear and grassy but surrounded by swamps. Cat tails grow adjacent to the sampler.

MOE-SES Network

1. Burwash:

Latitude (N): 46^{o} 16'

Longitude (W): 80^{o} 49'

Altitude (m): 229 MSL

Location: Former site of Burwash Industrial Farm.

Description: Samplers located in a large, clear, grassy area. Site is approx. 150m from Highway 17 and 50m from a paved access road. The site is roughly 30 Km SE of Sudbury.

Appendix 1-2

Planned Improvements for APOS Network

Appendix 1-2

The following discussion outlines several of the shortcomings and planned improvements related to the APOS sampling program.

(a) Instrumentation

The group of new Sangamo Type A collectors obtained for the intercomparison study proved to be more unreliable than any other group purchased by the Ministry of the Environment. Fortunately, the performance of these samplers improved as the study progressed but the overall performance was poor. Problems were compounded by the lack of adequate spare samplers and parts for the replacement and repair of the problem instruments. It should be noted that the performance of these instruments could have been imporved significantly by better organizational and operational design. This is discussed in more detail in the following section.

Another instrumentation problem was the collection vessel used for snow sampling. The type of bag and container vessel tended to produce leaks. Measures were taken to counteract this problem during the study but these were not totally satisfactory.

The new APOS network, therefore, was designed to include overhauls to all samplers before deployment to the field, ordering sufficient spare parts and samplers for replacement of malfunctioning units and improving the snow sampling instrumentation.

(b) Organization and Operations

These two factors are closely related and cannot be discussed independently.

It was apparent early in the intercomparison study that the APOS organization and its resulting effects on operations were not suitable for operating a long-term, province-wide network. However, the problems that did become apparent were very helpful in designing the final APOS network.

Specifically, at each sampler location, trained personnel were not available on-site to observe the operation of the sampler and report problems. In addition to this, the technicians responsible for the individual samplers were members of MOE regional staff. The APOS duties assigned to them were additional to their already busy workload and these duties often had lower priority than their regular work. Finally, because of the short-term nature of study, there was no opportunity to train the technicians on complicated instrument repairs. Hence, even if adequate on-site personnel were available to keep an eye on the samplers, the regional technicians probably could not respond to their needs.

Technical support for the repair and improvement of sampling instrumentation was carried out from Toronto. Again, this was a direct result of the short-term nature of the study.

In designing the final APOS network, these problems were noted and addressed. The structure was redesigned such that scientific and high-level technical direction continued to originate from Toronto. However, technicians with primary responsibility for APOS network operations were assigned to all MOE regions but one. These technicians were trained to make all repairs on the instrumentation and were provided with adequate spare instruments and spare parts. Their work program was structured to allow fast response for instrument repairs. Each technician was given responsibility for a manageable number of samplers. Operators were found at each sampling site to observe the samplers and notify the technicians of problems. These operators were also trained to carry out sample collection on a specified day at a specified time all across the province. This eliminated the problem of different collection periods at different locations.

Appendix 2-1

APOS Sampling Results

APOS (WET) - SAMPLING RESULTS -

(CONCENTRATION)

DATE: 03/09/81

STATION NAME : 01 BURWASH

PERIOD	TYPE	VOLUMN (ML.)	DEPTH (MM.)	COND. (OHM/CM)	PH	ACIDITY	SO4	N-NO3	N-NH4	CL	CA	K	NA
								(MG/L)					
*MAY30-JUN29.79	1.	1235.	40.93	44.00	3.95	6.31	5.05	0.550	0.550	0.31	0.44	0.09	0.08
*JUN29-JUL30.79	1.	2700.	89.49	36.50	4.32	5.20	3.70	0.340	0.250	0.11	0.29	0.04	0.05
JUL30-AUG30.79	1.	2420.	80.21	35.00	4.16	5.17	3.65	0.470	0.270	0.09	0.18	0.03	0.02
AUG30-OCT 1.79	1.	1760.	58.33	46.30	4.08	5.89	5.65	0.670	0.580	0.10	0.56	0.02	0.02
OCT 1-OCT31.79	1.	2465.	81.70	52.30	3.90	7.88	5.50	0.930	0.550	0.22	0.30	0.06	0.09
OCT31-NOV30.79	2.	2400.	79.54	36.70	4.11	5.52	2.75	0.810	0.340	0.18	0.11	< 0.01	0.06
*NOV30-JAN 2.80	12.	915.	30.33	9.00	5.38	1.71	0.85	0.160	0.178	0.80	0.13	0.24	0.51
JAN 2-JAN30.80	2.	1995.	66.12	35.00	4.21	4.96	3.15	0.600	0.390	0.34	0.18	0.07	0.18
JAN30-FEB28.80	2.	470.	15.58	44.50	4.03	6.67	3.10	0.920	0.286	0.60	0.20	0.04	0.45
FEB28-MAR31.80	***	1925.	63.80	28.50	4.24	4.34	2.90	0.620	0.470	0.19	0.29	0.03	0.11
MAR31-APR29.80	***	1495.	49.55	34.30	4.14	5.34	3.35	0.480	0.350	0.12	0.12	0.02	0.05

PERIOD	N-TKN	TP	MG	FE	CU	NI	PB	ZN	AL	CD	MN	[illegible]
						(MG/L)						
*MAY30-JUN29.79	******	*******	0.09	0.026	0.0040	0.0040	0.006	0.008	0.007	0.0003	*******	******
*JUN29-JUL30.79	0.300	0.0020	0.02	0.212	0.0030	0.0010	0.010	0.005	0.019	*******	0.0030	< 0.005
JUL30-AUG30.79	0.310	0.0010	0.06	0.018	0.0030	< 0.0010	0.008	0.006	0.056	*******	0.0030	< 0.002
AUG30-OCT 1.79	0.640	0.0040	0.09	0.063	0.0040	< 0.0010	0.011	0.010	0.027	*******	0.0060	< 0.002
OCT 1-OCT31.79	0.630	0.0020	0.04	0.032	0.0030	< 0.0010	0.017	< 0.011	0.040	*******	0.0050	< 0.002
OCT31-NOV30.79	0.370	< 0.0010	0.02	0.022	< 0.0020	0.0010	0.013	0.009	0.009	0.0004	0.0030	< 0.005
*NOV30-JAN 2.80	0.340	0.0090	0.02	0.072	0.0130	0.0020	0.008	0.029	0.032	0.0014	0.0010	< 0.005
JAN 2-JAN30.80	0.480	0.0060	0.01	0.035	0.0060	0.0020	0.010	0.010	0.022	0.0004	0.0030	< 0.005
JAN30-FEB28.80	0.700	0.0180	0.02	0.069	0.0020	0.0080	0.029	0.015	0.033	0.0013	0.0030	< 0.005
FEB28-MAR31.80	0.610	0.0060	0.02	0.027	0.0090	0.0090	0.018	0.011	0.018	0.0072	0.0090	0.005
MAR31-APR29.80	0.560	0.0060	0.02	0.057	0.0040	0.0060	0.021	0.009	0.042	0.0004	0.0040	< 0.001

FOR TYPE: 1-RAIN,2-SNOW. ***** -- NOT DETERMINED * -- EXCLUDED IN COMPARISON

APOS (WET) - SAMPLING RESULTS -

(CONCENTRATION)

DATE: 03/09/81

STATION NAME : 02 BURWASH 2

PERIOD	TYPE	VOLUMN (ML.)	DEPTH (MM.)	COND. (OHM/CM)	PH	ACIDITY	SO4	N-NO3	N-NH4 (MG/L)	CL	CA	MG	NA
JUL30-AUG30,79	1.	2200.	72.92	29.20	4.41	3.50	3.70	0.370	0.220	0.38	0.35	0.13	0.17
AUG30-OCT 1,79	1.	1620.	53.69	49.50	4.00	8.27	6.15	0.710	0.620	0.11	0.61	0.04	0.03
OCT 1-OCT31,79	1.	2345.	77.72	50.00	3.91	7.81	5.55	0.930	0.540	0.25	0.30	0.07	0.10
OCT31-NOV30,79	2.	2270.	75.24	35.70	4.16	5.59	2.75	0.820	0.330	0.49	0.12	0.03	0.31
+NOV30-JAN 2,80	12.	855.	28.34	14.70	5.07	2.43	1.45	0.270	0.238	1.45	0.20	0.49	0.88
JAN 2-JAN30,80	***	2175.	72.09	34.50	4.19	5.01	3.05	0.570	0.374	0.35	0.20	0.04	0.20
+JAN30-FEB28,80	2.	210.	6.96	*****	4.37	*****	1.55	0.420	0.208	0.44	0.09	< 0.01	0.34
+FEB28-MAR31,80	***	575.	19.06	*****	*****	*****	*****	******	******	*****	*****	*****	*****
+MAR31-APR29,80	***	645.	21.38	32.50	4.13	4.99	3.55	0.520	0.520	0.13	0.12	0.02	0.05

PERIOD	N-TKN	TP	MO	FE	CU	NI (MG/L)	PB	ZN	AL	CD	MN	V
JUL30-AUG30,79	0.500	0.0180	0.26	0.028	0.0070	0.0020	0.012	0.080	0.023	*******	0.0030	< 0.002
AUG30-OCT 1,79	0.680	0.0040	0.10	0.056	0.0100	< 0.0010	0.012	< 0.010	0.035	*******	0.0070	< 0.002
OCT 1-OCT31,79	0.660	0.0040	0.04	0.042	0.0050	0.0020	0.020	0.009	0.026	*******	0.0050	< 0.002
OCT31-NOV30,79	0.400	0.0020	0.03	0.026	< 0.0040	0.0020	0.014	0.013	0.008	0.0006	0.0030	< 0.001
+NOV30-JAN 2,80	0.430	0.0060	0.02	0.109	0.0270	0.0040	0.011	0.060	0.042	0.0031	0.0036	< 0.005
JAN 2-JAN30,80	0.480	0.0050	0.01	0.045	0.0060	0.0030	0.010	0.008	0.028	0.0004	0.0040	< 0.005
+JAN30-FEB28,80	******	*******	0.01	******	*******	*******	******	******	******	*******	*******	******
+FEB28-MAR31,80	******	*******	*****	******	*******	*******	******	******	******	*******	*******	******
+MAR31-APR29,80	0.940	0.0130	0.02	0.066	0.0040	< 0.0010	0.009	0.009	0.042	0.0002	0.0080	< 0.005

FOR TYPE: 1-RAIN,2-SNOW. ***** -- NOT DETERMINED + -- EXCLUDED IN COMPARISON

APOS (WET) - SAMPLING RESULTS -

(CONCENTRATION)

DATE: 03/09/81

STATION NAME : 03 ATIKOKAN

PERIOD	TYPE	VOLUMN (ML.)	DEPTH (MM.)	COND. (OHM/CM)	PH	ACIDITY	SO4	N-NO3	N-NH4 (MG/L)	CL	CA	K	NA
*MAY31-JUL 3,79	1.	2100.	69.60	27.50	4.32	4.47	4.45	0.530	0.630	0.27	0.53	*****	*****
*JUL 3-JUL31,79	1.	775.	25.69	12.70	4.69	3.43	1.60	0.160	0.240	0.12	0.16	0.07	0.08
*AUG31-SEP30,79	1.	400.	13.26	*****	4.44	*****	4.50	0.670	0.680	0.17	0.91	0.09	0.11
SEP30-OCT31,79	1.	2445.	81.04	18.30	4.53	3.02	2.45	0.450	0.400	0.13	0.45	0.04	0.05
OCT31-NOV30,79	1.	440.	14.58	11.70	4.99	2.02	1.30	0.350	0.410	0.13	0.16	0.01	0.04
JAN31-FEB29,80	2.	110.	3.65	*****	4.94	*****	1.50	0.570	******	1.65	*****	*****	*****
*FEB29-MAR31,80	***	437.	14.48	28.50	6.50	1.72	2.20	0.690	0.920	2.47	1.12	0.33	2.25
*MAR31-MAY 5,80	***	******	******	*****	*****	*****	*****	******	******	*****	*****	*****	*****

PERIOD	N-TKN	TP	MG	FE	CU	NI (MG/L)	PB	ZN	AL	CD	MN	V
*MAY31-JUL 3,79	0.760	0.0160	0.17	0.880	0.0010	< 0.0010	0.005	0.007	0.010	*******	0.0300	< 0.005
*JUL 3-JUL31,79	0.330	0.0030	0.03	0.142	0.0010	< 0.0010	0.005	0.015	0.003	*******	0.0070	< 0.005
*AUG31-SEP30,79	0.910	0.0200	0.13	******	*******	*******	******	******	******	*******	*******	******
SEP30-OCT31,79	0.490	0.0060	0.06	0.046	< 0.0030	< 0.0010	0.008	< 0.005	0.030	*******	0.0080	< 0.002
OCT31-NOV30,79	0.490	< 0.0010	0.03	0.131	< 0.0030	0.0020	0.008	0.010	0.034	< 0.0001	0.0160	0.005
JAN31-FEB29,80	******	*******	*****	******	*******	*******	******	******	******	*******	*******	******
*FEB29-MAR31,80	1.790	0.0440	0.15	0.046	0.0030	< 0.0010	0.006	0.008	0.154	0.0001	0.0020	< 0.005
*MAR31-MAY 5,80	******	*******	*****	******	*******	*******	******	******	******	*******	*******	******

FOR TYPE: 1-RAIN,2-SNOW, ***** -- NOT DETERMINED * -- EXCLUDED IN COMPARISON

APOS (WET) - SAMPLING RESULTS -

(CONCENTRATION)

DATE: 03/09/81

STATION NAME : 04 SIMCOE

PERIOD	TYPE	VOLUMN (ML.)	DEPTH (MM.)	COND. (OHM/CM)	PH	ACIDITY	SO4	N-NO3	N-NH4 (MG/L)	CL	CA	[illegible]	[illegible]
*JUL 1-JUL31,79	1.	220.	7.29	2.00	4.05	10.96	10.00	1.870	******	0.43	0.18	*****	*****
JUL31-AUG31,79	1.	2860.	94.79	68.50	3.91	8.45	8.20	0.950	0.670	0.23	0.75	0.04	0.08
AUG31-OCT 1,79	1.	2250.	74.57	19.40	4.39	3.24	2.40	0.230	0.110	0.05	0.27	0.02	< 0.01
OCT 1-OCT31,79	1.	2265.	75.07	56.00	3.92	8.11	6.15	1.160	0.800	0.32	0.58	0.09	0.06
OCT31-NOV30,79	2.	2900.	96.12	39.40	4.07	5.86	3.85	0.680	0.370	0.40	0.16	0.05	0.17
*JAN 3-JAN31,80	2.	1000.	33.14	2.20	5.65	1.12	0.05	0.010	0.006	0.02	< 0.01	< 0.01	0.01
JAN31-MAR 3,80	2.	265.	8.76	54.00	4.12	6.49	6.15	1.350	0.630	0.71	1.63	0.05	0.29
MAR 3-MAR31,80	***	2165.	71.76	38.00	4.03	5.63	3.50	0.700	0.360	0.25	0.33	0.06	0.09

PERIOD	N-IKN	IP	MG	FE	CU	NI (MG/L)	PB	ZN	AL	CD	MN	[illegible]
*JUL 1-JUL31,79	2.200	0.0430	0.57	******	*******	*******	******	******	******	*******	*******	******
JUL31-AUG31,79	0.760	0.0050	0.16	0.108	0.0030	< 0.0010	0.021	0.014	0.083	*******	0.0100	< 0.002
AUG31-OCT 1,79	0.160	0.0020	0.05	0.029	< 0.0040	< 0.0010	0.007	0.011	< 0.019	*******	0.0030	< 0.002
OCT 1-OCT31,79	0.004	0.8900	0.08	0.053	0.0030	< 0.0010	0.025	< 0.017	0.033	*******	0.0090	< 0.002
OCT31-NOV30,79	0.390	< 0.0010	0.05	0.030	0.0020	< 0.0010	0.012	0.011	0.023	0.0003	0.0050	< 0.005
*JAN 3-JAN31,80	0.020	< 0.0010	< 0.01	< 0.001	< 0.0010	< 0.0010	0.001	0.002	< 0.005	< 0.0001	< 0.0010	< 0.005
JAN31-MAR 3,80	0.780	0.0100	0.32	******	*******	*******	******	******	******	*******	*******	******
MAR 3-MAR31,80	0.540	0.0080	0.05	0.010	< 0.0010	< 0.0010	0.012	0.014	0.011	0.0005	0.0050	< 0.005

FOR TYPE: 1-RAIN,2-SNOW. ***** -- NOT DETERMINED * -- EXCLUDED IN COMPARISON

APOS (WET) - SAMPLING RESULTS -

(CONCENTRATION)

DATE: 03/09/81

STATION NAME : 05 PICKLE LAKE

PERIOD	TYPE	VOLUMN (ML.)	DEPTH (MM.)	COND. (OHM/CM)	PH	ACIDITY	SO4	N-NO3	N-NH4 (MG/L)	CL	CA	[illegible]	MA
*MAY31-JUL 2,79	1.	1370.	45.41	9.10	5.08	2.53	1.70	0.210	0.290	0.08	0.29	0.19	0.03
JUL 2-JUL31,79	1.	1250.	41.43	8.70	5.12	2.77	1.35	0.110	0.200	0.07	0.08	0.03	0.02
*SEP 1-OCT 1,79	1.	1140.	37.78	8.35	6.25	1.17	1.00	0.150	0.200	0.15	0.17	0.18	0.08
*FEB15-MAR 4,80	2.	130.	4.31	*****	4.77	*****	0.85	0.090	******	0.08	0.10	< 0.01	0.07
*MAR 4-APR 9,80	***	60.	1.99	*****	*****	*****	*****	******	******	*****	*****	*****	*****
*APR 9-MAY15,80	***	80.	2.65	*****	*****	*****	*****	******	******	*****	*****	*****	*****

PERIOD	N-TKN	TP	MG	FE	CU	NI (MG/L)	PB	ZN	AL	CD	MN	V
*MAY31-JUL 2,79	0.530	0.0470	0.13	0.150	0.0010	0.0020	0.003	0.007	0.001	*******	0.0500	< 0.005
JUL 2-JUL31,79	0.230	0.0010	0.01	0.226	< 0.0030	< 0.0010	0.004	< 0.003	0.057	*******	0.0060	< 0.005
*SEP 1-OCT 1,79	0.510	0.0050	0.03	0.056	0.0170	0.0010	0.008	< 0.027	0.030	*******	0.0060	< 0.002
*FEB15-MAR 4,80	******	*******	0.01	******	*******	*******	******	******	******	*******	*******	******
*MAR 4-APR 9,80	******	*******	*****	******	*******	*******	******	******	******	*******	*******	******
*APR 9-MAY15,80	******	*******	*****	******	*******	*******	******	******	******	*******	*******	******

FOR TYPE: 1-RAIN,2-SNOW. ***** -- NOT DETERMINED * -- EXCLUDED IN COMPARISON

APOS (WET) - SAMPLING RESULTS -

(CONCENTRATION)

DATE: 03/09/81

STATION NAME : 06 KINGSTON

PERIOD	TYPE	VOLUMN (ML.)	DEPTH (MM.)	COND. (OHM/CM)	PH	ACIDITY	SO4	N-NO3	N-NH4 (MG/L)	CL	CA	[illegible]	MG
*MAY30-JUN30.79	1.	450.	14.91	2.00	6.91	22.76	8.95	1.190	0.925	0.53	0.51	1.84	0.09
JUN30-JUL31.79	1.	730.	24.19	40.00	4.28	5.61	4.50	0.680	0.380	0.24	0.62	0.10	0.06
AUG31-SEP30.79	1.	4570.	151.47	20.70	4.37	3.48	1.80	0.220	0.030	0.05	0.16	0.01	0.01
SEP30-NOV 1.79	1.	2405.	79.71	43.50	3.99	6.40	4.55	0.600	0.480	0.19	0.44	0.05	0.07
NOV 1-NOV30.79	2.	2370.	78.55	44.50	4.04	6.81	3.85	1.060	0.470	0.20	0.20	0.02	0.04
*NOV30-JAN 1.80	2.	1465.	48.56	32.50	4.50	3.93	3.90	1.060	0.670	0.45	1.20	0.13	0.24
JAN 1-FEB 1.80	2.	665.	22.04	20.00	6.03	1.39	3.75	0.630	0.372	0.46	1.95	0.03	0.21
FEB 1-FEB29.80	2.	220.	7.29	52.50	4.36	*****	6.75	1.960	0.720	1.01	*****	0.04	0.64
*FEB29-MAR31.80	***	2385.	79.05	15.20	5.23	1.98	2.20	0.470	0.380	0.47	0.71	0.43	0.04
*MAR31-MAY 1.80	***	2755.	91.31	22.50	4.44	3.34	2.55	0.570	0.400	0.22	0.49	0.13	0.15
*MAY 1-JUN 3.80	***	715.	23.70	35.00	4.60	3.54	6.80	0.750	1.450	0.20	1.24	0.23	0.11

PERIOD	N-IKN	*IP	MG	FE	CU*	NI (MG/L)	PB	ZN	[illegible]	CD	MN	[illegible]
*MAY30-JUN30.79	8.800	1.5100	0.88	******	*******	*******	******	******	******	*******	*******	******
JUN30-JUL31.79	0.560	0.0140	0.13	0.167	< 0.0070	< 0.0010	0.013	0.009	0.035	*******	0.0100	< 0.005
AUG31-SEP30.79	0.090	0.0020	0.02	0.010	< 0.0010	< 0.0010	0.005	< 0.008	< 0.004	*******	0.0010	< 0.002
SEP30-NOV 1.79	0.570	0.0070	0.05	0.031	< 0.0030	< 0.0010	0.020	< 0.009	0.031	*******	0.0050	< 0.002
NOV 1-NOV30.79	0.520	< 0.0010	0.03	0.025	< 0.0010	< 0.0010	0.019	0.016	0.016	0.0002	0.0040	< 0.005
*NOV30-JAN 1.80	0.900	0.0030	0.13	0.054	0.0050	0.0020	0.021	0.032	0.035	0.0007	0.0070	< 0.005
JAN 1-FEB 1.80	0.560	0.0060	0.20	0.126	< 0.0040	< 0.0010	0.005	0.082	0.107	0.0005	0.0120	< 0.005
FEB 1-FEB29.80	******	*******	0.29	******	*******	*******	******	******	******	*******	*******	******
*FEB29-MAR31.80	0.640	0.0100	0.06	0.016	0.0120	0.0040	0.018	0.044	0.018	0.0095	0.0050	< 0.005
*MAR31-MAY 1.80	0.620	0.0170	0.05	******	*******	< 0.0010	< 0.001	******	******	< 0.0001	< 0.0010	< 0.005
*MAY 1-JUN 3.80	1.980	0.1760	0.17	0.068	0.0050	< 0.0010	0.036	0.009	0.060	< 0.0001	0.0010	< 0.005

FOR TYPE: 1-RAIN,2-SNOW. ***** -- NOT DETERMINED * -- EXCLUDED IN COMPARISON

APOS (WET) - SAMPLING RESULTS -

(CONCENTRATION)

DATE: 03/09/81

STATION NAME : 07 DORSET

PERIOD	TYPE	VOLUMN (ML.)	DEPTH (MM.)	COND. (OHM/CM)	PH	ACIDITY	SO4	N-NO3	N-NH4 (MG/L)	CL	CA	K	NA
*JUN30-JUL31.79	1.	2500.	82.86	31.50	4.40	4.71	4.10	0.400	0.150	0.18	0.19	0.07	0.02
*JUL31-SEP 1.79	***	4250.	140.86	36.50	4.01	5.36	3.80	0.450	0.250	0.21	0.21	0.04	0.04
SEP 1-OCT 1.79	1.	2700.	89.49	53.00	3.99	7.15	6.00	0.630	0.500	0.11	0.35	0.02	0.02
*OCT 1-OCT31.79	1.	3325.	110.20	25.70	4.23	4.36	2.05	0.450	0.190	0.10	0.08	0.03	0.01
OCT31-NOV30.79	2.	2720.	90.15	32.70	4.12	5.18	2.65	0.650	0.340	0.18	0.08	0.03	0.04
*NOV30-JAN 2.80	2.	2065.	68.44	29.20	4.48	10.57	3.15	0.780	0.680	0.49	0.34	0.30	0.33
*JAN 2-JAN31.80	12.	2075.	68.77	31.50	4.20	4.84	3.00	0.450	0.250	0.14	0.17	0.14	0.05
*JAN31-MAR 5.80	2.	435.	14.42	50.00	3.99	7.26	2.50	1.280	0.194	0.32	0.23	< 0.01	0.12
MAR 5-MAR31.80	***	2845.	94.29	25.50	4.18	4.23	2.15	0.490	0.250	0.11	0.31	0.02	0.10
MAR31-APR30.80	***	2625.	87.00	32.00	4.11	4.96	2.85	0.590	0.370	0.07	0.09	< 0.01	0.02
*APR30-MAY31.80	***	1195.	39.61	34.00	4.26	4.57	4.25	0.580	0.490	0.13	0.56	0.07	0.05

PERIOD	N-TKN	TP	MG	FE	CU	NI (MG/L)	PB	ZN	AL	CD	MN	V
*JUN30-JUL31.79	0.190	0.0060	0.08	0.051	< 0.0030	< 0.0010	0.008	0.002	0.012	*******	0.0020	< 0.005
*JUL31-SEP 1.79	0.290	0.0060	0.04	0.025	0.0140	0.0090	0.013	0.014	0.006	0.0005	0.0020	< 0.005
SEP 1-OCT 1.79	0.560	0.0030	0.05	0.040	< 0.0020	< 0.0010	0.015	< 0.012	0.021	*******	0.0060	< 0.002
*OCT 1-OCT31.79	0.230	0.0020	0.01	0.011	0.0030	< 0.0010	0.014	0.004	0.017	*******	0.0010	< 0.002
OCT31-NOV30.79	0.350	0.0010	0.02	0.019	< 0.0010	< 0.0010	0.010	0.007	0.007	0.0002	0.0020	< 0.005
*NOV30-JAN 2.80	0.910	0.0070	0.04	0.021	0.0090	0.0020	0.012	0.041	0.018	0.0007	0.0040	< 0.005
*JAN 2-JAN31.80	0.310	0.0040	0.01	0.046	< 0.0020	< 0.0010	0.007	0.003	0.045	0.0002	0.0040	< 0.005
*JAN31-MAR 5.80	0.480	0.0130	0.02	0.061	0.0040	< 0.0010	0.009	0.012	0.050	0.0002	0.0050	< 0.005
MAR 5-MAR31.80	0.320	0.0020	0.03	0.070	0.0110	0.0040	0.007	0.070	0.023	0.0032	0.0060	< 0.005
MAR31-APR30.80	0.480	0.0030	0.02	0.018	0.0010	< 0.0010	< 0.001	0.003	0.007	< 0.0001	< 0.0010	< 0.005
*APR30-MAY31.80	0.600	0.0080	0.11	0.079	0.0030	< 0.0010	< 0.001	0.009	0.045	0.0002	0.0030	< 0.005

FOR TYPE: 1-RAIN,2-SNOW. ***** -- NOT DETERMINED * -- EXCLUDED IN COMPARISON

APOS (WET) - SAMPLING RESULTS -

(CONCENTRATION)

DATE: 03/09/81

STATION NAME : 08 SOUTH RAYMOUTH

PERIOD	TYPE	VOLUMN (ML.)	DEPTH (MM.)	COND. (OHM/CM)	PH	ACIDITY	SO4	N-NO3	N-NH4	CL	CA	MG	NA
								(MG/L)					
AUG 2-AUG31.79	1.	1160.	38.45	43.00	4.14	5.54	5.15	0.670	0.490	0.17	0.56	0.05	0.07
AUG31-OCT 1.79	1.	900.	29.83	45.20	4.20	7.42	5.90	0.850	0.700	0.32	1.07	0.04	0.07
*OCT 1-OCT31.79	1.	2825.	93.63	45.00	3.99	6.66	4.60	0.850	0.540	0.16	0.26	0.06	0.05
*OCT31-NOV30.79	2.	2160.	71.59	36.00	4.25	5.48	2.90	0.800	0.380	0.18	0.12	0.05	0.05
NOV30-DEC31.80	2.	785.	26.02	22.50	4.61	3.80	2.25	0.650	0.560	0.18	0.28	0.04	0.07
*DEC31-FEB 1.80	2.	310.	10.27	53.00	7.30	*****	8.35	1.440	0.620	0.53	5.65	0.09	0.24
MAR31-APR30.80	***	2165.	71.76	20.50	4.46	*****	3.00	0.450	0.750	0.16	0.21	0.08	0.05

PERIOD	N-TKN	IP	MG	FE	CU	NI	PB	ZN	AL	CD	MN	V
						(MG/L)						
AUG 2-AUG31.79	0.560	0.0020	0.11	0.054	< 0.0020	< 0.0010	0.012	0.013	0.053	*******	0.0060	< 0.002
AUG31-OCT 1.79	0.780	0.0010	0.21	0.080	0.0050	< 0.0010	0.013	< 0.016	0.060	*******	0.0120	< 0.002
*OCT 1-OCT31.79	0.630	0.0050	0.04	0.026	< 0.0020	< 0.0010	0.018	0.010	0.014	*******	0.0040	< 0.002
*OCT31-NOV30.79	0.440	0.0010	0.03	0.023	< 0.0010	< 0.0010	0.011	0.016	< 0.008	0.0002	0.0030	< 0.005
NOV30-DEC31.80	0.720	0.0020	0.07	0.074	0.0040	< 0.0010	0.018	0.022	0.038	0.0003	0.0030	< 0.005
*DEC31-FEB 1.80	1.290	0.0360	2.10	0.355	0.0190	0.0010	0.011	0.111	0.227	0.0003	0.0120	< 0.005
MAR31-APR30.80	1.050	0.0560	0.05	0.048	0.0120	0.0020	0.023	0.024	0.380	< 0.0001	0.0280	< 0.005

FOR TYPE: 1-RAIN,2-SNOW. ***** -- NOT DETERMINED * -- EXCLUDED IN COMPARISON

APOS (WET) - SAMPLING RESULTS -

(CONCENTRATION)

DATE: 03/09/81

STATION NAME : 09 WOODBRIDGE

PERIOD	TYPE	VOLUMN (ML.)	DEPTH (MM.)	COND. (OHM/CM)	PH	ACIDITY	SO4	N-NO3	N-NH4 (MG/L)	CL	CA	[illegible]	NA
*JUN 1-JUN29.79	1.	1280.	42.42	66.00	3.96	8.84	7.50	1.030	0.700	0.28	0.96	0.07	0.14
*JUN29-JUL31.79	1.	1500.	49.72	88.00	4.01	10.42	9.88	1.720	0.880	0.38	1.23	0.10	0.06
JUL31-AUG31.79	1.	2375.	78.72	64.50	3.92	8.17	6.35	0.770	0.260	0.25	0.39	0.03	0.02
AUG31-SEP28.79	1.	1310.	43.42	25.20	4.37	3.56	3.35	0.320	0.160	0.13	0.56	0.02	0.02
SEP28-NOV 1.79	1.	2425.	80.37	60.50	3.90	8.34	6.50	1.230	0.830	0.33	0.71	0.06	0.04
NOV 1-NOV30.79	2.	2320.	76.89	35.40	4.16	5.34	3.65	0.790	0.330	0.37	0.52	0.02	0.09
NOV30-DEC31.80	2.	1835.	60.82	22.70	4.50	3.25	2.80	0.450	0.336	0.41	0.55	< 0.01	0.21
DEC31-JAN31.80	2.	******	******	*****	*****	*****	*****	******	******	*****	*****	*****	*****
*JAN31-MAR 6.80	2.	24.	0.80	*****	*****	*****	*****	******	******	*****	*****	*****	*****
*MAR 6-MAR31.80	***	1175.	38.94	21.50	6.43	2.81	3.75	0.640	0.510	0.55	1.56	0.04	0.20
MAR31-APR30.80	***	1725.	57.17	29.00	4.14	4.23	3.45	0.600	0.520	0.21	0.50	0.02	0.05

PERIOD	N-IKN	IP	MG	FE	CU	NI (MG/L)	PB	ZN	AL	CD	MN	[illegible]
*JUN 1-JUN29.79	0.780	0.0050	0.18	0.750	0.0030	< 0.0010	0.021	0.035	0.030	*******	0.0670	< 0.005
*JUN29-JUL31.79	1.020	0.0050	0.32	0.088	0.0070	< 0.0010	0.038	0.024	0.045	*******	0.0450	< 0.005
JUL31-AUG31.79	0.310	0.0010	0.08	0.265	0.0020	< 0.0010	0.019	0.012	0.036	*******	0.0060	< 0.002
AUG31-SEP28.79	0.220	0.0020	0.14	0.058	< 0.0030	< 0.0010	0.011	< 0.015	0.035	*******	0.0050	< 0.002
SEP28-NOV 1.79	0.900	0.0020	0.13	0.074	0.0050	< 0.0010	0.044	< 0.015	0.037	*******	0.0090	< 0.002
NOV 1-NOV30.79	0.390	0.0020	0.10	0.051	< 0.0020	0.0020	0.025	0.015	0.037	0.0003	0.0070	< 0.005
NOV30-DEC31.80	0.400	0.0040	0.12	0.077	< 0.0020	< 0.0010	0.014	0.007	0.087	0.0004	0.0040	< 0.005
DEC31-JAN31.80	******	*******	*****	******	*******	*******	******	******	******	*******	*******	******
*JAN31-MAR 6.80	******	*******	*****	1.237	0.0960	0.0040	0.034	0.140	0.505	0.0009	0.0570	< 0.005
*MAR 6-MAR31.80	0.760	0.0090	0.65	0.056	0.0090	0.0010	0.070	0.022	0.040	0.0001	< 0.0010	< 0.005
MAR31-APR30.80	0.740	0.0100	0.08	0.083	0.0020	< 0.0010	0.035	0.012	0.052	0.0003	0.0100	< 0.005

FOR TYPE: 1-RAIN,2-SNOW. ***** -- NOT DETERMINED * -- EXCLUDED IN COMPARISON

APOS (WET) - SAMPLING RESULTS -

(CONCENTRATION)

DATE: 03/09/81

STATION NAME : 10 LONG POINT

PERIOD	TYPE	VOLUMN (ML.)	DEPTH (MM.)	COND. (OHM/CM)	PH	ACIDITY	SO4	N-NO3	N-NH4	CL	CA	MG	NA
								(MG/L)					
JUL 9-JUL31,79	1.	1100.	36.46	42.30	4.27	5.75	5.15	0.470	0.520	0.21	0.46	0.14	0.09
JUL31-SEP 5,79	1.	3040.	100.76	58.00	3.94	7.76	5.50	0.720	0.350	0.14	0.14	0.04	0.03
SEP 5-OCT 1,79	1.	1910.	63.30	13.60	5.15	1.94	2.45	0.220	0.550	0.08	0.33	0.12	0.04
*OCT 1-NOV 1,79	1.	1325.	43.92	80.50	3.77	10.63	9.85	1.630	1.170	0.50	1.10	0.14	0.11
*NOV 1-DEC 3,79	2.	2700.	89.49	41.20	4.11	5.99	5.25	1.040	0.720	0.44	0.75	0.09	0.17
*DEC 3-JAN 2,80	2.	2535.	84.02	25.50	4.40	4.27	2.70	0.370	0.306	0.15	0.21	< 0.01	0.05
*JAN 2-JAN31,80	2.	70.	2.32	*****	*****	*****	*****	******	******	*****	*****	*****	*****
*JAN31-MAR 3,80	2.	260.	8.62	48.00	4.19	*****	5.45	1.410	0.680	0.68	1.61	< 0.01	0.36

PERIOD	N-TKN	TP	MG	FE	CU	NI	PB	ZN	AL	CD	MN	V
						(MG/L)						
JUL 9-JUL31,79	0.740	0.0780	0.08	0.052	0.0030	< 0.0010	0.011	0.006	0.032	*******	0.0050	< 0.005
JUL31-SEP 5,79	0.480	0.0060	0.03	0.110	< 0.0010	< 0.0010	0.013	0.011	0.019	*******	0.0030	< 0.002
SEP 5-OCT 1,79	0.710	0.0890	0.06	0.025	< 0.0030	< 0.0010	0.005	0.009	0.015	*******	0.0030	< 0.002
*OCT 1-NOV 1,79	1.320	0.0060	0.15	0.098	0.0040	< 0.0010	0.032	0.221	0.057	*******	0.0160	< 0.002
*NOV 1-DEC 3,79	0.810	0.0280	0.15	0.063	0.0010	< 0.0010	0.017	0.015	0.043	0.0002	0.0110	< 0.005
*DEC 3-JAN 2,80	0.400	0.0010	0.01	0.035	< 0.0010	< 0.0010	0.007	0.004	0.027	0.0001	0.0030	< 0.005
*JAN 2-JAN31,80	1.210	0.0100	*****	******	*******	*******	******	******	******	*******	*******	******
*JAN31-MAR 3,80	1.070	0.0150	0.28	******	*******	*******	******	******	******	*******	*******	******

FOR TYPE: 1-RAIN,2-SNOW. ***** -- NOT DETERMINED * -- EXCLUDED IN COMPARISON

APOS (WET) - SAMPLING RESULTS -

(CONCENTRATION)

DATE: 03/09/81

STATION NAME : 11 WIARTON

PERIOD	TYPE	VOLUMN (ML.)	DEPTH (MM.)	COND. (OHM/CM)	PH	ACIDITY	SO4	N-NO3	N-NH4 (MG/L)	CL	CA	MG	NA
*JUL 1-JUL31.79	1.	350.	11.60	66.00	4.16	7.87	8.90	1.230	0.390	0.38	*****	*****	0.06
*JUL31-AUG31.79	1.	690.	22.87	27.30	4.32	4.02	2.85	0.360	0.250	0.07	0.18	0.02	0.03
*AUG31-OCT 1.79	1.	100.	3.31	*****	4.09	*****	*****	******	******	*****	0.98	*****	*****
*OCT 1-OCT31.79	1.	2865.	94.96	22.20	4.31	3.75	2.15	0.490	0.230	0.10	0.16	0.05	0.04
*OCT31-NOV29.79	2.	2220.	73.58	32.20	4.18	4.73	2.85	0.700	0.420	0.11	0.13	< 0.01	0.02
*NOV29- JAN 7.80	2.	1695.	56.18	19.50	4.87	1.51	3.00	0.560	0.660	0.26	1.45	0.09	0.17
*JAN 7-JAN31.80	***	50.	1.66	*****	*****	*****	*****	******	******	*****	*****	*****	*****
FEB29-MAR31.80	***	1585.	52.53	29.50	4.26	3.96	3.40	0.780	0.720	0.21	0.49	0.15	0.14
MAR31-APR30.80	***	******	******	*****	*****	*****	*****	******	******	*****	*****	*****	*****

PERIOD	N-TKN	TP	MO	FE	CU	NI (MG/L)	PB	ZN	AL	CD	MN	V
*JUL 1-JUL31.79	0.580	0.0230	0.62	******	*******	*******	******	******	******	*******	*******	******
*JUL31-AUG31.79	0.230	0.0020	0.03	0.096	0.0060	< 0.0010	0.011	0.016	0.080	*******	0.0080	< 0.002
*AUG31-OCT 1.79	0.810	0.0060	0.19	******	*******	*******	******	******	******	*******	*******	******
*OCT 1-OCT31.79	0.320	0.0030	0.03	0.009	0.0020	< 0.0010	0.008	< 0.005	0.006	*******	0.0020	< 0.002
*OCT31-NOV29.79	0.470	0.0010	0.03	0.013	< 0.0010	< 0.0010	0.010	0.006	< 0.008	0.0002	0.0020	< 0.005
*NOV29-JAN 7.80	0.850	0.0050	0.05	0.040	0.0030	< 0.0010	0.004	0.014	0.031	0.0008	0.0080	< 0.005
*JAN 7-JAN31.80	******	*******	*****	******	*******	*******	******	******	******	*******	*******	******
FEB29-MAR31.80	0.920	0.0780	0.11	0.023	0.0030	< 0.0010	0.001	0.005	0.016	< 0.0001	0.0020	< 0.005
MAR31-APR30.80	*******	*******	*****	******	*******	*******	******	******	******	*******	*******	******

FOR TYPE: 1-RAIN,2-SNOW. ***** -- NOT DETERMINED * -- EXCLUDED IN COMPARISON

Appendix 2-2

CANSAP Sampling Results

CANSAP - SAMPLING RESULTS -

(CONCENTRATION)

STATION NAME : 1 RUNWASH 1

PERIOD	TYPE	VOLUMN (ML.)	DEPTH (MM.)	COND. (OHM/CM)	PH	ACIDITY	SO4	N-NO3	N-NH4 (MG/L)	CL	CA	K	NA
*MAY30-JUN29,79	1.	1518.	50.31	48.50	4.20	3.80	5.60	0.620	0.539	0.19	0.47	0.06	0.15
*JUN29-JUL30,79	1.	3020.	100.09	34.60	4.30	3.60	3.10	0.312	0.135	0.15	0.05	0.06	0.09
JUL30-AUG30,79	1.	2100.	69.60	26.70	4.40	2.10	2.80	0.370	0.167	0.06	0.13	0.04	0.02
AUG30-OCT 1,79	***	1638.	54.29	49.70	4.10	4.20	6.00	0.450	0.565	0.20	0.75	0.09	0.15
OCT 1-OCT31,79	***	2310.	76.56	67.20	4.00	6.70	6.00	0.970	0.485	0.20	0.31	0.06	0.09
OCT31-NOV30,79	***	2430.	80.54	40.00	4.10	3.35	3.20	0.900	0.333	1.04	0.50	0.25	0.75
NOV30-JAN 2,80	***	1050.	34.80	28.40	4.20	2.46	1.80	0.610	0.263	0.23	1.30	0.08	0.41
JAN 2-JAN30,80	***	2070.	68.61	27.20	4.30	2.40	2.80	0.520	0.252	0.56	0.39	0.07	0.28
JAN30-FEB28,80	***	472.	15.64	42.00	4.30	3.40	2.16	0.920	0.259	2.20	0.14	0.45	1.95
FEB28-MAR31,80	***	1710.	56.68	32.00	4.40	2.90	2.50	0.700	0.421	2.97	0.40	0.12	0.27
MAR31-MAY 1,80	***	2570.	85.18	28.00	4.30	2.90	2.60	0.325	0.013	0.43	0.25	0.12	0.43

PERIOD	N-TKN	IP	MG	FE	CU	NI (MG/L)	PB	ZN	AL	CD	MN	V
*MAY30-JUN29,79	******	0.0260	0.07	0.014	0.0100	0.0010	0.015	0.011	******	< 0.0010	*******	******
*JUN29-JUL30,79	******	0.0040	0.02	0.009	0.0040	< 0.0010	0.007	0.006	******	0.0006	*******	******
JUL30-AUG30,79	******	0.0030	0.03	0.007	0.0030	0.0010	0.008	0.005	******	< 0.0010	*******	******
AUG30-OCT 1,79	******	0.0080	0.17	0.006	0.0140	< 0.0010	0.010	0.006	******	< 0.0010	*******	******
OCT 1-OCT31,79	******	0.0040	0.05	0.014	0.0040	0.0005	0.018	0.007	******	< 0.0010	*******	******
OCT31-NOV30,79	******	0.0130	0.06	0.009	0.0080	0.0020	0.025	0.040	******	0.0030	*******	******
NOV30-JAN 2,80	******	0.0330	0.07	0.022	0.0070	0.0050	0.011	0.009	******	0.0010	*******	******
JAN 2-JAN30,80	******	0.0470	0.06	0.012	0.0090	0.0020	0.013	0.014	******	0.0010	*******	******
JAN30-FEB28,80	******	0.0070	0.03	0.016	0.0130	0.0070	0.027	0.050	******	0.0050	*******	******
FEB28-MAR31,80	******	0.0080	0.05	0.006	0.0090	0.0030	0.011	0.015	******	0.0010	*******	******
MAR31-MAY 1,80	******	0.0490	0.04	0.006	0.0060	0.0020	0.007	0.011	******	0.0010	*******	******

FOR TYPE: 1-MAIN,2-SNOW. ***** -- NOT DETERMINED * -- EXCLUDED IN COMPARISON

CANSAP - SAMPLING RESULTS -

(CONCENTRATION)

STATION NAME : 2 BURWASH 2

PERIOD	TYPE	VOLUMN (ML.)	DEPTH (MM.)	COND. (OHM/CM)	PH	ACIDITY	SO4	N-NO3	N-NH4 (MG/L)	CL	CA	K	NA
*MAY30-JUN29,79	1.	1247.	41.33	56.70	4.10	4.80	6.90	0.750	0.620	0.26	0.83	0.09	0.20
*JUN29-JUL30,79	1.	2820.	93.46	36.90	4.30	3.10	4.00	0.344	0.244	0.23	0.05	0.12	0.12
JUL30-AUG30,79	1.	1680.	55.68	41.90	4.40	2.20	7.80	0.740	1.110	0.32	0.47	0.46	0.10
AUG30-OCT 1,79	***	1580.	52.37	53.80	4.00	4.60	6.80	0.490	0.768	0.20	0.70	0.09	0.10
OCT 1-OCT31,79	***	2320.	76.89	70.70	*****	7.00	6.50	1.000	0.515	0.24	0.32	0.07	0.10
OCT31-NOV30,79	***	2130.	70.60	40.20	4.00	4.12	2.90	0.870	0.344	0.21	0.30	0.12	0.20
NOV30-JAN 2,80	***	1155.	38.28	26.80	4.20	2.39	1.80	0.550	0.272	0.13	0.95	0.05	0.20
JAN 2-JAN31,80	***	2220.	73.58	33.10	4.20	2.90	3.00	0.580	0.243	0.76	0.36	0.15	0.35
JAN31-FEB28,80	***	444.	14.72	42.40	4.30	2.60	2.27	0.970	0.295	2.40	0.28	0.65	2.15
FEB28-MAR31,80	***	1675.	55.52	32.00	4.30	2.70	2.40	0.680	0.399	3.48	0.39	0.09	0.30
MAR31-MAY 1,80	***	2560.	84.85	33.00	4.20	3.70	2.70	0.463	0.140	0.17	0.25	0.07	0.35

PERIOD	N-TKN	TP	MG	FE	CU	NI (MG/L)	PB	ZN	AL	CD	MN	V
*MAY30-JUN29,79	******	0.0250	0.10	0.008	0.0150	0.0010	0.014	0.020	******	0.0010	*******	******
*JUN29-JUL30,79	******	0.0040	0.02	0.006	0.0040	0.0010	0.007	0.010	******	0.0002	*******	******
JUL30-AUG30,79	******	0.2200	0.22	0.016	0.0080	< 0.0010	0.009	0.019	******	< 0.0010	*******	******
AUG30-OCT 1,79	******	0.0460	0.16	0.005	0.0150	< 0.0010	0.013	0.006	******	< 0.0010	*******	******
OCT 1-OCT31,79	******	0.0040	0.05	0.010	0.0050	0.0005	0.016	0.009	******	0.0010	*******	******
OCT31-NOV30,79	******	0.0070	0.03	0.012	0.0070	0.0030	0.014	0.014	******	0.0090	*******	******
NOV30-JAN 2,80	******	0.0140	0.04	0.011	0.0040	0.0030	0.009	0.006	******	0.0090	*******	******
JAN 2-JAN31,80	******	0.0190	0.04	0.009	0.0100	0.0030	0.011	0.020	******	0.0010	*******	******
JAN31-FEB28,80	******	0.0160	0.05	0.022	0.0300	0.0140	0.023	0.060	******	0.0060	*******	******
FEB28-MAR31,80	******	0.0030	0.04	0.008	0.0060	0.0020	0.012	0.023	******	0.0020	*******	******
MAR31-MAY 1,80	******	0.0200	0.03	0.006	0.0070	0.0040	0.007	0.011	******	0.0020	*******	******

FOR TYPE: 1-RAIN,2-SNOW. ***** -- NOT DETERMINED * -- EXCLUDED IN COMPARISON

CANSAP - SAMPLING RESULTS -

(CONCENTRATION)

STATION NAME : 3 ATIKOKAN

PERIOD	TYPE	VOLUMN (ML.)	DEPTH (MM.)	COND. (OHM/CM)	PH	ACIDITY	SO4	N=NO3	N=NH4 (MG/L)	CL	CA	MG	NA
*MAY31-JUN30.79	1.	3100.	102.74	20.20	4.70	0.80	3.10	0.590	0.354	0.24	0.60	0.14	0.10
JUN30-JUL31.79	1.	2300.	76.23	12.90	4.80	0.30	2.20	0.212	0.232	0.17	0.20	0.07	0.06
*JUL31-AUG31.79	1.	2980.	98.77	11.20	5.00	*****	1.20	0.290	0.291	0.12	0.33	0.05	0.05
AUG31-SEP30.79	***	570.	18.89	32.00	4.50	1.30	4.90	0.480	0.835	0.31	1.10	0.13	0.14
SEP30-OCT31.79	***	2000.	66.29	21.60	4.60	0.70	2.50	0.520	0.430	0.19	0.52	0.07	0.06
OCT31-NOV30.79	***	800.	26.51	16.70	4.70	0.41	2.40	0.430	0.349	0.36	0.65	0.13	0.30
*NOV30-DEC31.79	***	410.	13.59	18.20	5.20	*****	1.90	0.770	0.560	1.10	3.75	0.14	1.40
*DEC31-JAN31.80	***	550.	18.23	19.00	4.50	1.10	1.30	0.470	0.092	0.92	0.41	0.07	0.42
JAN31-FEB29.80	***	38.	1.26	*****	4.30	*****	2.27	******	******	7.40	0.84	*****	*****
FEB29-MAR31.80	***	80.	2.65	11.00	5.20	*****	14.60	4.360	3.800	32.73	0.10	0.51	4.65
*MAR31-APR30.80	***	16.	0.53	*****	5.90	*****	13.80	******	******	14.70	*****	*****	*****
*APR30-MAY31.80	***	1050.	34.80	41.90	4.40	1.70	7.30	0.780	1.208	0.91	1.17	0.18	0.60

PERIOD	N=TKN	IP	MO	EE	CU	NI (MG/L)	PB	ZN	AL	CD	MN	V
*MAY31-JUN30.79	0.613	0.0200	0.10	0.003	0.0050	< 0.0010	0.005	0.008	******	0.0010	0.0170	******
JUN30-JUL31.79	0.354	0.0100	0.06	0.007	0.0060	< 0.0010	0.005	0.006	0.015	0.0001	0.0090	******
*JUL31-AUG31.79	0.572	0.0460	0.04	< 0.001	0.0100	< 0.0010	0.001	0.004	< 0.002	< 0.0010	0.0060	******
AUG31-SEP30.79	1.022	0.0410	0.16	0.004	0.0060	0.0010	0.012	0.013	0.027	0.0010	0.0190	******
SEP30-OCT31.79	0.529	0.0070	0.08	0.004	0.0040	0.0010	0.005	0.007	0.007	< 0.0010	0.0100	******
OCT31-NOV30.79	0.482	0.0540	0.07	0.005	0.0040	0.0020	0.009	0.009	0.028	0.0020	0.0250	******
*NOV30-DEC31.79	0.855	0.1970	0.16	******	*******	*******	******	******	0.012	*******	0.0250	******
*DEC31-JAN31.80	0.093	0.0410	0.05	0.010	0.0030	0.0020	0.008	0.007	0.022	0.0030	0.0100	******
JAN31-FEB29.80	******	*******	0.20	******	*******	*******	******	******	******	*******	*******	******
FEB29-MAR31.80	3.900	*******	0.66	******	*******	*******	******	******	******	*******	*******	******
*MAR31-APR30.80	******	*******	*****	******	*******	*******	******	******	******	*******	*******	******
*APR30-MAY31.80	1.210	0.0350	0.22	0.030	0.0030	0.0010	0.012	0.008	0.049	0.0010	0.0400	******

FOR TYPE: 1-RAIN,2-SNOW. ***** -- NOT DETERMINED * -- EXCLUDED IN COMPARISON

CANSAP - SAMPLING RESULTS -

(CONCENTRATION)

STATION NAME : 4 SIMCOE

PERIOD	TYPE	VOLUMN (ML.)	DEPTH (MM.)	COND. (OHM/CM)	PH	ACIDITY	SO4	N-NO3	N-NH4 (MG/L)	CL	CA	[illegible]	NA
*JUN 1-JUN30,79	1.	1460.	48.39	89.50	4.00	8.10	10.30	1.240	0.835	0.24	1.03	0.09	0.05
JUN30-JUL31,79	1.	483.	16.01	87.20	4.10	5.40	0.90	1.180	2.270	0.42	1.70	0.19	0.15
JUL31-AUG31,79	1.	2610.	86.50	81.00	3.90	7.60	9.20	1.000	0.786	0.25	0.83	0.09	0.10
AUG31-SEP30,79	***	1650.	54.69	38.80	4.20	3.30	4.20	0.370	0.135	0.09	0.62	0.04	0.04
SEP30-OCT31,79	***	1950.	64.63	85.00	3.90	7.70	9.00	1.420	0.990	0.60	0.84	0.10	0.24
OCT31-NOV30,79	***	2425.	80.37	49.00	4.00	4.44	5.90	0.880	0.722	0.50	0.60	0.22	0.31
*NOV30-DEC31,79	***	2350.	77.89	42.20	4.10	*****	3.60	0.600	0.279	0.60	0.40	0.11	0.45
*DEC31-JAN31,80	***	1200.	39.77	32.30	4.40	1.40	4.00	0.650	0.254	0.99	1.60	0.11	0.39
JAN31-FEB29,80	***	340.	11.27	53.30	5.70	*****	7.90	2.000	0.417	3.55	0.66	1.32	1.11
FEB29-MAR31,80	***	2760.	91.48	39.30	4.20	1.60	2.70	0.740	0.064	0.40	0.54	0.19	0.30
*MAR31-APR30,80	***	2900.	96.12	40.20	4.10	3.70	3.30	0.560	0.205	0.27	0.43	0.10	0.20

PERIOD	N-IKN	IP	MG	FE	CU	NI (MG/L)	PB	ZN	AL	CD	MN	[illegible]
*JUN 1-JUN30,79	0.920	0.0240	0.19	0.120	0.0040	< 0.0010	0.020	0.017	******	0.0010	0.0190	******
JUN30-JUL31,79	2.580	0.0710	0.49	0.220	0.0070	0.0020	0.024	0.020	0.220	0.0009	0.0220	******
JUL31-AUG31,79	0.848	0.0260	0.18	0.003	0.0060	< 0.0010	0.005	0.007	0.054	< 0.0010	0.0120	******
AUG31-SEP30,79	0.209	0.0160	0.13	0.009	0.0040	< 0.0010	0.008	0.005	0.027	< 0.0010	0.0090	******
SEP30-OCT31,79	1.190	0.0160	0.14	0.055	0.0060	0.0005	0.027	0.023	0.064	< 0.0010	0.0120	******
OCT31-NOV30,79	1.001	0.1300	0.11	0.011	0.0100	0.0020	0.014	0.003	0.035	< 0.0010	0.0050	******
*NOV30-DEC31,79	0.407	0.0170	0.06	0.010	0.0080	< 0.0010	0.006	0.009	0.023	< 0.0010	0.0050	******
*DEC31-JAN31,80	0.280	0.0300	0.26	0.002	0.0100	0.0010	0.005	0.016	0.050	0.0010	0.0200	******
JAN31-FEB29,80	0.754	0.2420	0.64	0.002	1.1000	0.0040	0.004	0.055	0.007	0.0010	0.0300	******
FEB29-MAR31,80	0.151	0.0430	0.08	0.009	0.0280	< 0.0010	0.006	0.008	0.036	< 0.0010	0.0100	******
*MAR31-APR30,80	0.296	0.0160	0.07	0.013	0.0110	0.0010	0.007	0.005	0.028	0.0010	0.0020	******

FOR TYPE: 1-RAIN,2-SNOW. ***** -- NOT DETERMINED * -- EXCLUDED IN COMPARISON

CANSAP - SAMPLING RESULTS -

(CONCENTRATION)

STATION NAME : 15 PICKLE LAKE

PERIOD	TYPE	VOLUMN (ML.)	DEPTH (MM.)	COND. (OHM/CM)	PH	ACIDITY	SO4	N-NO3	N-NH4 (MG/L)	CL	CA	K	MG
MAY31-JUL 2,79	1.	2052.	68.01	8.80	5.30	*****	1.70	0.370	0.200	0.32	0.27	0.11	0.31
JUL 2-JUL31,79	1.	4417.	146.39	11.60	5.00	0.30	1.50	0.133	0.147	0.15	0.10	0.06	0.04
+JUL31-SEP 1,79	1.	5382.	178.38	5.10	5.30	*****	0.80	0.080	0.070	0.02	0.05	0.02	0.04
SEP 1-OCT 1,79	***	2845.	94.29	8.70	4.90	*****	1.10	0.090	0.156	0.10	0.22	0.04	0.20
+OCT 1-NOV 1,79	***	3185.	105.56	20.20	6.20	*****	2.00	0.220	0.607	1.10	0.65	0.99	0.77
+FEB15-FEB29,80	***	21.	0.70	*****	7.20	*****	13.80	******	******	2.40	*****	*****	*****
+FEB29-APR 9,80	***	4158.	137.81	3.30	5.80	*****	0.20	0.050	0.025	0.08	0.40	0.06	0.20
APR 9-MAY15,80	***	102.	3.38	23.90	6.50	*****	2.60	0.290	0.070	*****	2.50	*****	*****
+MAY15-JUN 2,80	***	909.	30.13	24.20	6.20	*****	4.30	0.590	0.750	0.22	2.00	0.47	0.20

PERIOD	N-TKN	IP	MG	FE	CU	NI (MG/L)	PB	ZN	AL	CD	MN	V
MAY31-JUL 2,79	0.289	0.1050	0.05	0.002	0.0010	< 0.0010	0.002	0.002	******	< 0.0010	0.0040	******
JUL 2-JUL31,79	0.235	0.0140	0.04	0.001	0.0020	< 0.0010	0.002	0.001	0.007	0.0001	0.0030	******
+JUL31-SEP 1,79	******	*******	0.01	< 0.001	0.0020	< 0.0010	0.001	0.001	< 0.002	< 0.0010	0.0010	******
SEP 1-OCT 1,79	0.224	0.0490	0.04	0.001	0.0010	< 0.0010	0.002	0.001	0.002	< 0.0010	0.0030	******
+OCT 1-NOV 1,79	1.120	0.0570	0.11	0.003	0.0090	0.0015	0.002	0.025	0.004	0.0010	0.0040	******
+FEB15-FEB29,80	******	*******	*****	******	*******	*******	******	******	******	*******	*******	*******
+FEB29-APR 9,80	0.178	0.0280	0.03	< 0.001	0.0030	< 0.0010	< 0.001	0.003	< 0.002	< 0.0010	0.0040	******
APR 9-MAY15,80	0.366	0.2120	0.33	******	*******	*******	******	******	******	*******	*******	******
+MAY15-JUN 2,80	******	0.0910	0.35	0.004	0.0030	0.0010	0.001	0.007	******	< 0.0010	*******	******

FOR TYPE: 1-RAIN,2-SNOW. ***** -- NOT DETERMINED + -- EXCLUDED IN COMPARISON

CANSAP - SAMPLING RESULTS -

(CONCENTRATION)

STATION NAME : 6 KINGSTON

PERIOD	TYPE	VOLUMN (ML.)	DEPTH (MM.)	COND. (OHM/CM)	PH	ACIDITY	SO4	N-NO3	N-NH4 (MG/L)	CL	CA	K	NA
*MAY31-JUN30.79	1.	440.	14.58	88.60	4.00	6.60	12.80	1.610	0.892	0.43	2.55	0.21	0.48
JUN30-JUL31.79	1.	483.	16.01	56.70	4.40	3.40	9.00	0.959	1.020	0.24	1.85	0.19	0.11
*JUL31-AUG31.79	1.	1820.	60.32	79.30	3.90	8.40	8.50	1.070	0.585	0.22	0.47	0.16	0.05
*AUG31-SEP30.79	***	******	******	*****	*****	*****	*****	******	******	*****	*****	*****	*****
SEP30-OCT31.79	***	2400.	79.54	57.20	4.10	4.90	5.70	0.970	0.433	0.27	0.66	0.10	0.07
OCT31-NOV30.79	***	2500.	82.86	55.80	3.90	5.77	4.90	1.240	0.501	0.12	0.70	0.08	0.20
NOV30-DEC31.79	***	2200.	72.92	39.10	4.20	2.76	3.60	0.980	0.349	0.21	4.50	0.09	0.25
DEC31-JAN31.80	***	800.	26.51	27.20	5.20	*****	4.00	1.080	0.093	1.30	2.90	0.71	1.39
JAN31-FEB29.80	***	260.	8.62	45.80	5.10	*****	7.34	1.950	0.758	1.60	4.44	0.71	0.41
FEB29-MAR31.80	***	2960.	98.10	32.20	4.30	2.10	3.20	0.910	0.267	0.21	1.03	0.16	0.04
MAR31-APR30.80	***	4100.	135.89	25.60	4.30	2.40	2.00	0.620	0.241	0.05	0.70	0.10	0.20
*APR30-MAY31.80	***	720.	23.86	38.20	4.50	1.40	7.10	0.860	1.200	0.16	1.90	0.18	0.20

PERIOD	N-TKN	IP	MG	FE	CU	NI (MG/L)	PB	ZN	AL	CD	MN	V
*MAY31-JUN30.79	1.620	0.0670	0.31	0.130	0.0400	0.0040	0.032	0.100	******	0.0050	0.0180	******
JUN30-JUL31.79	1.270	0.0740	0.23	0.045	0.0090	0.0015	0.019	0.022	0.060	0.0010	0.0080	******
*JUL31-AUG31.79	0.624	0.0160	0.06	0.027	0.0020	< 0.0010	0.017	0.012	0.027	< 0.0010	0.0040	******
*AUG31-SEP30.79	******	*******	*****	******	*******	*******	******	******	******	*******	*******	******
SEP30-OCT31.79	0.532	0.0030	0.08	0.025	0.0020	0.0005	0.020	0.013	0.022	< 0.0010	0.0060	******
OCT31-NOV30.79	0.569	0.0150	0.05	0.026	0.0020	0.0010	0.021	0.016	0.022	0.0010	0.0030	******
NOV30-DEC31.79	0.471	0.0200	0.18	0.024	0.0020	< 0.0010	0.013	0.016	0.025	0.0010	0.0050	******
DEC31-JAN31.80	0.950	0.0510	0.26	0.001	0.0030	0.0010	0.002	0.055	0.007	< 0.0010	0.0050	******
JAN31-FEB29.80	0.839	0.0580	0.50	******	*******	*******	******	******	******	*******	*******	******
FEB29-MAR31.80	0.282	0.0140	0.10	0.017	0.0040	0.0010	0.018	0.023	0.027	< 0.0010	0.0050	******
MAR31-APR30.80	0.298	0.0160	0.07	< 0.001	0.0030	< 0.0010	< 0.001	0.002	0.015	< 0.0010	0.0180	******
*APR30-MAY31.80	1.320	0.0750	0.20	0.002	0.0030	< 0.0010	0.005	0.024	0.022	0.0010	0.0120	******

FOR TYPE: 1-RAIN,2-SNOW. ***** -- NOT DETERMINED * -- EXCLUDED IN COMPARISON

CANSAP - SAMPLING RESULTS -

(CONCENTRATION)

STATION NAME : 7 DORSET

PERIOD	TYPE	VOLUMN (ML.)	DEPTH (MM.)	COND. (OHM/CM)	PH	ACIDITY	SO4	N-NO3	N-NH4 (MG/L)	CL	CA	K	NA
*JUL13-JUL31.79	1.	1750.	58.00	52.10	4.20	4.90	5.10	0.585	0.319	0.26	0.35	0.06	0.06
*JUL31-AUG31.79	1.	3600.	119.32	33.60	4.20	3.40	3.10	0.450	0.218	0.04	0.16	0.04	0.02
AUG31-SEP30.79	***	******	******	69.50	3.90	6.60	8.00	0.780	0.584	0.17	0.42	0.07	< 0.02
*SEP30-OCT31.79	***	4200.	139.20	39.80	4.10	3.40	3.10	0.560	0.188	0.29	0.23	0.07	0.14
OCT31-NOV30.79	***	4200.	139.20	37.90	4.10	3.83	2.90	0.670	0.294	0.05	0.20	0.04	0.05
NOV30-JAN 2.80	***	1800.	59.66	24.90	4.30	2.24	2.00	0.650	0.280	< 0.05	1.70	0.06	0.11
*JAN 2-JAN25.80	***	1750.	58.00	22.60	4.30	2.40	2.40	0.230	0.007	0.39	0.36	0.12	0.12
MAR 5-MAR31.80	***	2800.	92.80	29.50	4.20	2.90	2.30	0.560	0.204	0.16	0.20	0.11	< 0.02
MAR31-APR30.80	***	2100.	69.60	38.30	4.10	*****	2.20	0.600	0.266	0.05	0.23	0.06	0.20

PERIOD	N-TKN	IP	MG	FE	CU	NI (MG/L)	PB	ZN	AL	CD	MN	V
*JUL13-JUL31.79	0.479	0.0190	0.07	0.011	0.0090	0.0010	0.008	0.007	0.021	0.0003	0.0040	******
*JUL31-AUG31.79	0.309	0.0070	0.03	0.007	0.0020	< 0.0010	0.007	0.004	0.008	< 0.0010	0.0020	******
AUG31-SEP30.79	0.682	0.0080	0.07	0.020	0.0020	< 0.0010	0.016	0.010	0.024	< 0.0010	0.0060	******
*SEP30-OCT31.79	0.331	0.0150	0.03	0.005	0.0050	< 0.0010	0.008	0.005	0.006	0.0010	0.0030	******
OCT31-NOV30.79	0.357	0.0050	0.03	0.007	0.0020	< 0.0010	0.011	0.006	0.013	< 0.0010	0.0020	******
NOV30-JAN 2.80	0.458	0.0380	0.08	0.050	0.0060	< 0.0010	0.010	0.013	0.031	0.0010	0.0050	******
*JAN 2-JAN25.80	0.050	0.0120	0.05	0.027	0.0700	< 0.0010	0.008	0.011	0.026	< 0.0010	0.0050	******
MAR 5-MAR31.80	0.210	0.0050	0.03	0.022	0.0020	0.0010	0.007	0.005	0.010	< 0.0010	0.0050	******
MAR31-APR30.80	0.384	0.0050	0.02	0.017	0.0020	< 0.0010	0.007	0.005	< 0.002	0.0010	0.0030	******

FOR TYPE: 1-RAIN, 2-SNOW. ***** -- NOT DETERMINED * -- EXCLUDED IN COMPARISON

Appendix 2-3

GLPN (CCIW) Sampling Results

CCIW (WET) - SAMPLING RESULTS -

(CONCENTRATION)

STATION NAME : 1 BURWASH 1

PERIOD	TYPE	VOLUMN (ML.)	DEPTH (MM.)	COND. (OHM/CM)	PH	ACIDITY	SO4	N-NO3	N-NH4 (MG/L)	CL	CA	K	NA
*MAY30-JUN29,79	1.	710.	23.53	39.80	4.29	2.00	6.70	0.716	0.487	0.39	1.52	0.21	0.22
*JUN29-JUL30,79	1.	2191.	72.62	22.10	4.58	1.10	3.80	0.311	0.254	0.21	0.09	0.04	0.07
JUL30-AUG30,79	1.	1691.	56.05	47.50	3.91	4.90	5.30	0.550	0.357	0.08	0.31	0.07	0.05
AUG30-OCT 1,79	***	1613.	53.46	45.30	3.84	4.20	6.00	0.640	0.630	0.01	0.42	0.05	0.03
OCT 1-OCT31,79	***	2381.	78.91	58.50	3.94	6.50	6.30	1.210	0.534	0.96	0.28	0.08	0.10
OCT31-NOV30,79	***	1929.	63.93	38.20	4.04	3.80	2.31	0.870	0.338	0.21	0.90	0.04	0.08
NOV30-JAN 2,80	***	1163.	38.55	27.10	4.30	2.83	2.04	0.531	0.231	0.65	0.20	0.05	0.11
JAN 2-JAN30,80	***	2154.	71.39	36.00	4.16	3.10	3.00	0.600	0.289	0.50	0.31	0.04	0.14
JAN30-FEB28,80	***	433.	14.35	39.30	4.16	3.20	1.97	0.870	0.291	1.40	0.32	0.05	0.75
FEB28-MAR31,80	***	1728.	57.27	33.50	4.21	3.00	2.50	0.540	0.276	0.06	0.26	0.16	0.04
MAR31-APR29,80	1.	2032.	67.35	38.60	4.08	4.00	3.00	0.530	0.238	0.06	0.40	0.08	< 0.20

PERIOD	N-TKN	TP	MG	FE	CU	NI (MG/L)	PB	ZN	AL	CD	MN	V
*MAY30-JUN29,79	0.620	0.0260	0.29	0.025	0.0170	0.0010	0.013	0.022	******	0.0008	*******	******
*JUN29-JUL30,79	0.343	0.0050	0.20	0.004	0.0100	< 0.0010	0.009	0.019	******	< 0.0001	*******	******
JUL30-AUG30,79	0.481	0.0110	0.07	0.016	0.0130	< 0.0010	0.009	0.006	******	< 0.0001	*******	******
AUG30-OCT 1,79	0.715	0.0060	0.06	0.013	0.0130	0.0005	0.007	0.005	******	0.0001	*******	******
OCT 1-OCT31,79	0.684	0.0030	0.03	0.028	0.0190	0.0005	0.016	0.010	******	0.0002	*******	******
OCT31-NOV30,79	0.407	0.0020	0.02	0.035	0.0200	0.0020	0.012	0.008	******	0.0002	*******	******
NOV30-JAN 2,80	0.276	0.0020	0.05	0.040	0.0190	0.0150	0.009	0.005	******	0.0004	*******	******
JAN 2-JAN30,80	0.384	0.0030	0.04	0.028	0.0140	0.0020	0.011	0.007	******	0.0005	*******	******
JAN30-FEB28,80	0.450	0.0090	0.05	******	*******	*******	******	******	******	*******	*******	******
FEB28-MAR31,80	0.470	0.0020	0.03	0.043	0.0090	0.0040	0.013	0.010	******	0.0009	*******	******
MAR31-APR29,80	0.231	0.0020	0.02	0.015	0.0110	0.0010	0.007	0.006	******	0.0004	*******	******

FOR TYPE: 1-RAIN,2-SNOW. ***** -- NOT DETERMINED * -- EXCLUDED IN COMPARISON

CCIW (WET) - SAMPLING RESULTS -

(CONCENTRATION)

STATION NAME : 2 HURWASH 2

PERIOD	TYPE	VOLUMN (ML.)	DEPTH (MM.)	COND. (OHM/CM)	PH	ACIDITY	SO4	N-NO3	N-NH4 (MG/L)	CL	CA	K	MG
*MAY30-JUN29.79	1.	547.	18.13	68.00	3.90	6.50	8.40	0.826	0.611	0.27	0.88	0.19	0.22
*JUN29-JUL30.79	1.	2793.	92.57	31.70	4.23	3.10	3.40	0.304	0.206	0.11	0.92	0.02	0.03
JUL30-AUG30.79	1.	1458.	48.32	51.00	3.90	5.40	4.70	0.600	0.299	0.12	0.19	0.05	< 0.02
AUG30-OCT 1.79	***	1631.	54.06	47.00	3.83	4.00	6.20	0.660	0.633	0.10	0.47	0.05	0.05
OCT 1-OCT31.79	***	2322.	76.96	59.50	3.96	5.40	6.30	1.260	0.593	0.51	0.32	0.12	0.15
OCT31-NOV30.79	***	1921.	63.67	40.20	4.03	4.84	2.50	0.840	0.085	0.24	2.40	0.02	0.10
NOV30-JAN 2.80	***	1024.	33.94	30.60	4.24	3.58	2.34	0.661	0.290	1.03	0.20	0.05	0.29
JAN 2-JAN30.80	***	2324.	77.03	34.30	4.18	3.10	2.80	0.570	0.278	0.40	0.23	0.04	0.08
JAN30-FEB28.80	***	428.	14.19	43.50	4.08	4.00	2.49	0.980	0.326	0.90	0.29	0.02	0.55
FEB28-MAR31.80	***	1593.	52.80	34.80	4.22	3.50	2.50	0.590	0.313	0.05	0.26	0.16	0.04
MAR31-APR29.80	***	2042.	67.68	64.00	3.85	6.90	2.90	0.510	0.257	2.16	0.32	0.06	< 0.20

PERIOD	N-TKN	IP	MG	FE	CU	NI (MG/L)	PB	ZN	AL	CD	MN	V
*MAY30-JUN29.79	0.769	0.0400	0.14	0.026	0.0130	0.0010	0.022	0.016	******	0.0008	*******	******
*JUN29-JUL30.79	0.291	0.0020	0.02	0.009	0.0120	< 0.0010	0.008	0.003	******	< 0.0001	*******	******
JUL30-AUG30.79	0.397	0.0040	0.04	0.011	0.0100	< 0.0010	0.009	0.007	******	0.0008	*******	******
AUG30-OCT 1.79	0.682	0.0040	0.06	0.010	0.0130	0.0005	0.007	0.005	******	0.0002	*******	******
OCT 1-OCT31.79	0.753	0.0030	0.05	0.026	0.0160	0.0010	0.017	0.014	******	0.0003	*******	******
OCT31-NOV30.79	0.303	0.0150	0.02	0.013	0.0075	0.0005	0.015	0.010	******	0.0020	*******	******
NOV30-JAN 2.80	0.387	0.0020	0.05	0.035	0.0260	0.0450	0.013	0.009	******	0.0015	*******	******
JAN 2-JAN30.80	0.291	0.0040	0.02	0.018	0.0110	0.0010	0.010	0.004	******	0.0002	*******	******
JAN30-FEB28.80	0.520	0.0080	0.04	******	*******	*******	******	******	******	*******	*******	******
FEB28-MAR31.80	0.490	0.0010	0.03	0.030	0.0200	0.0035	0.012	0.010	******	0.0009	*******	******
MAR31-APR29.80	0.241	0.0030	0.02	0.015	0.0100	0.0005	0.007	0.006	******	0.0002	*******	******

FOR TYPE: 1-RAIN,2-SNOW. ***** -- NOT DETERMINED * -- EXCLUDED IN COMPARISON

CCIW (WET) - SAMPLING RESULTS -

(CONCENTRATION)

STATION NAME : 8 S. BAYMOUTH

PERIOD	TYPE	VOLUMN (ML.)	DEPTH (MM.)	COND. (OHM/CM)	PH	ACIDITY	SO4	N-NO3	N-NH4 (MG/L)	CL	CA	K	NA
*JUN 1-JUL 1.79	1.	2310.	76.56	54.20	3.97	4.90	6.10	0.685	0.491	0.29	0.41	0.18	0.13
*JUL 1-AUG 1.79	1.	704.	23.33	80.00	3.85	7.40	7.70	1.950	0.904	0.32	0.78	0.15	0.10
AUG 1-AUG31.79	1.	2250.	74.57	42.00	4.15	3.40	4.00	0.530	0.259	0.43	0.42	0.25	0.30
AUG31-OCT 1.79	***	871.	28.87	40.80	3.83	2.80	5.20	0.680	0.280	0.70	0.80	0.30	0.20
*OCT 1-NOV 1.79	***	2694.	89.29	48.30	3.98	4.10	5.00	1.400	0.522	0.49	0.27	0.20	0.11
*NOV 1-NOV30.79	***	1841.	61.02	38.70	4.08	3.65	2.61	0.840	0.247	0.40	0.30	0.29	0.2-
NOV30-DEC31.79	***	1122.	37.19	26.60	5.76	*****	3.44	0.931	0.855	3.15	0.85	1.68	1.05
DEC31-FEB 1.80	***	925.	30.66	27.20	6.12	*****	4.40	0.745	0.325	1.60	1.77	1.60	0.74
*MAR 1-MAR31.80	***	1431.	47.43	23.60	5.56	*****	2.50	0.600	0.549	1.26	0.84	1.17	0.90
MAR31-MAY 1.80	***	2161.	71.62	25.70	5.28	*****	3.70	0.730	0.900	1.24	0.70	1.06	0.80

PERIOD	N-ISO	IR	MG	FE	CU	NI (MG/L)	PB	ZN	AL	CD	MN	V
*JUN 1-JUL 1.79	0.627	0.0060	0.09	0.014	0.0130	< 0.0010	0.010	0.015	******	< 0.0001	*******	******
*JUL 1-AUG 1.79	1.160	0.0020	0.19	0.050	0.0330	< 0.0010	0.027	0.021	******	0.0002	*******	******
AUG 1-AUG31.79	0.450	0.0070	0.06	0.015	0.0120	< 0.0010	0.010	0.014	******	0.0001	*******	******
AUG31-OCT 1.79	0.707	0.2400	0.13	0.017	0.0160	0.0005	0.007	0.015	******	0.0005	*******	******
*OCT 1-NOV 1.79	0.731	0.0050	0.05	0.015	0.0150	0.0005	0.016	0.015	******	0.0003	*******	******
*NOV 1-NOV30.79	0.401	0.0030	0.07	0.011	0.0110	0.0005	0.011	0.021	******	0.0005	*******	******
NOV30-DEC31.79	1.960	0.0510	0.23	0.050	0.0260	0.0020	0.018	0.050	******	0.0008	*******	******
DEC31-FEB 1.80	0.801	0.0130	0.56	0.010	0.0140	< 0.0001	0.005	0.038	******	0.0005	*******	******
*MAR 1-MAR31.80	1.720	0.0140	18.00	0.350	0.0150	0.0005	0.005	0.026	******	0.0004	*******	******
MAR31-MAY 1.80	1.140	0.0120	0.20	0.024	0.0160	0.0005	0.008	0.020	******	0.0005	*******	******

FOR TYPE: 1-RAIN,2-SNOW. ***** -- NOT DETERMINED * -- EXCLUDED IN COMPARISON

CCIW (WET) - SAMPLING RESULTS -

(CONCENTRATION)

STATION NAME : 9 WOODBRIDGE

PERIOD	TYPE	VOLUMN (ML.)	DEPTH (MM.)	COND. (OHM/CM)	PH	ACIDITY	SO4	N-NO3	N-NH4 (MG/L)	CL	CA	[illegible]	[illegible]
MAY31- JUN29.79	1.	1817.	60.22	53.30	4.02	5.60	6.70	0.874	0.687	0.45	0.68	0.22	0.22
*JUN29- JUL31.79	1.	1462.	48.46	85.00	3.80	9.50	9.50	1.440	0.818	0.38	0.72	0.08	0.08
JUL31-AUG30.79	***	2373.	78.65	68.00	3.73	7.30	6.60	0.800	0.237	0.24	0.37	0.05	0.07
AUG30-SEP28.79	***	1336.	44.28	22.60	4.15	1.50	3.20	0.280	0.125	0.10	0.35	0.05	0.02
SEP28-NOV 1.79	***	2727.	90.38	66.00	3.90	8.60	6.90	1.620	0.755	1.50	0.43	0.04	0.05
NOV 1-NOV30.79	***	2281.	75.60	34.50	4.16	3.19	2.83	0.800	0.304	0.71	1.50	0.15	0.32
NOV30- JAN 2.80	***	2086.	69.20	28.90	4.22	3.77	2.44	0.531	0.231	1.90	0.20	0.03	0.11
JAN 2-FEB 1.80	***	795.	26.35	26.10	4.45	1.90	3.30	0.399	0.229	0.80	0.79	0.10	0.20
*FEB 1-MAR 3.80	***	219.	7.26	23.00	3.82	6.80	6.48	1.020	0.553	11.50	4.47	0.13	2.25
*MAR 3-MAR31.80	***	1585.	52.53	46.80	4.03	4.70	2.30	0.560	0.191	1.28	0.26	0.17	0.18
MAR31-APR30.80	***	3022.	100.16	44.80	4.03	5.00	3.40	0.630	0.376	0.98	0.49	0.05	< 0.20

PERIOD	N-TKN	IP	MG	EE	CU	NI (MG/L)	PB	ZN	AL	CD	MN	V
MAY31- JUN29.79	0.962	0.0030	0.11	0.045	0.0100	0.0020	0.017	0.020	******	0.0005	*******	******
*JUN29-JUL31.79	0.860	0.0080	0.15	0.070	0.0280	< 0.0010	0.033	0.020	******	0.0004	*******	******
JUL31-AUG30.79	0.391	0.0050	0.07	0.022	0.0130	< 0.0010	0.012	0.010	******	0.0001	*******	******
AUG30-SEP28.79	0.246	0.0060	0.06	0.010	0.0110	0.0005	0.004	0.004	******	0.0002	*******	******
SEP28-NOV 1.79	0.908	0.0020	0.08	0.040	0.0160	0.0010	0.030	0.015	******	0.0002	*******	******
NOV 1-NOV30.79	0.429	0.0040	0.08	0.028	0.0150	0.0005	0.016	0.015	******	0.0003	*******	******
NOV30-JAN 2.80	0.281	0.0030	0.04	0.018	0.0140	0.0010	0.009	0.007	******	0.0002	*******	******
JAN 2-FEB 1.80	0.306	0.0030	0.21	0.021	0.0180	< 0.0005	0.010	0.011	******	0.0002	*******	******
*FEB 1-MAR 3.80	0.800	0.0130	1.47	******	*******	*******	******	******	******	*******	*******	******
*MAR 3-MAR31.80	0.340	0.0030	0.05	0.025	0.0129	0.0003	0.012	0.008	******	0.0002	*******	******
MAR31-APR30.80	0.390	0.0020	0.06	0.014	0.0065	< 0.0005	0.010	0.005	******	< 0.0001	*******	******

FOR TYPE: 1-RAIN,2-SNOW. ***** -- NOT DETERMINED * -- EXCLUDED IN COMPARISON

CCIW (WET) - SAMPLING RESULTS -

(CONCENTRATION)

STATION NAME : 10 LONG POINT

PERIOD	TYPE	VOLUMN (ML.)	DEPTH (MM.)	COND. (OHM/CM)	PH	ACIDITY	SO4	N-NO3	N-NH4 (MG/L)	CL	CA	[illegible]	[illegible]
*JUN13-JUL 6,79	1.	1492.	49.45	70.00	3.80	7.70	7.10	0.924	0.299	0.46	0.60	0.20	0.1[illegible]
JUL 6-JUL30,79	1.	1083.	35.89	41.00	4.14	4.20	5.30	0.484	0.452	0.37	0.29	0.09	0.1[illegible]
JUL30-SEP 5,79	1.	3254.	107.85	55.00	4.13	5.60	4.90	0.690	0.425	0.21	0.20	0.13	0.1[illegible]
SEP 5-OCT 1,79	***	1897.	62.87	8.70	4.41	0.30	1.70	0.170	0.119	0.10	0.15	0.05	0.0[illegible]
*OCT 1-NOV 1,79	***	2438.	80.80	52.10	3.96	5.70	6.30	1.000	0.765	0.51	0.50	0.10	0.0[illegible]
NOV 1-DEC 3,79	***	2635.	87.33	42.30	4.00	4.49	3.70	0.760	0.355	0.30	0.20	0.05	0.1[illegible]
*DEC 3-JAN 2,80	***	3126.	103.61	32.40	4.21	5.73	2.26	0.781	0.301	1.64	0.90	0.06	0.0[illegible]
*JAN 2-FEB 4,80	***	607.	20.12	29.00	4.28	2.10	2.60	0.355	0.145	1.10	0.60	0.05	0.1[illegible]
*FEB 4-MAR 3,80	***	259.	8.58	56.30	4.07	4.30	5.47	1.390	0.692	0.80	1.56	0.15	0.2[illegible]
*MAR 3-APR 1,80	***	2516.	83.39	38.20	4.12	4.20	2.40	0.580	0.122	0.11	0.20	0.17	< 0.02
*APR 1-MAY 5,80	***	2741.	90.85	52.50	3.98	5.20	3.70	0.670	0.339	1.07	0.48	0.05	< 0.20

PERIOD	N-TKN	IP	MG	FE	CU	NI (MG/L)	PB	ZN	AL	CD	MN	V
*JUN13-JUL 6,79	0.448	0.0060	0.10	0.021	0.0150	0.0010	0.009	0.014	******	0.0040	*******	******
JUL 6-JUL30,79	0.665	0.0200	0.04	0.011	0.0100	< 0.0010	0.004	0.007	******	0.0005	*******	******
JUL30-SEP 5,79	0.733	0.0300	0.04	0.022	0.0060	< 0.0010	0.008	0.010	******	0.0003	*******	******
SEP 5-OCT 1,79	0.287	0.0150	0.03	0.034	0.0150	0.0005	0.002	0.005	******	0.0003	*******	******
*OCT 1-NOV 1,79	0.946	0.0220	0.06	0.030	0.0150	0.0005	0.020	0.018	******	0.0002	*******	******
NOV 1-DEC 3,79	0.466	0.0010	0.04	0.014	0.0150	0.0005	0.014	0.012	******	0.0005	*******	******
*DEC 3-JAN 2,80	0.420	0.0030	0.05	0.014	0.0120	0.0005	0.011	0.011	******	0.0003	*******	******
*JAN 2-FEB 4,80	0.189	0.0070	0.11	0.032	0.0160	0.0005	0.005	0.004	******	0.0002	*******	******
*FEB 4-MAR 3,80	1.060	0.0300	0.32	******	*******	*******	******	******	******	*******	*******	******
*MAR 3-APR 1,80	0.260	0.0080	0.02	0.015	0.0015	0.0005	0.002	0.003	******	< 0.0001	*******	******
*APR 1-MAY 5,80	1.140	0.0060	0.06	0.018	0.0070	< 0.0005	0.006	0.005	******	< 0.0001	*******	******

FOR TYPE: 1-RAIN,2-SNOW. ***** -- NOT DETERMINED * -- EXCLUDED IN COMPARISON

CCIW (WET) - SAMPLING RESULTS -

(CONCENTRATION)

STATION NAME : 11 WIARTON

PERIOD	TYPE	VOLUMN (ML.)	DEPTH (MM.)	COND. (OHM/CM)	PH	ACIDITY	SO4	N-NO3	N-NH4 (MG/L)	CL	CA	MG	NA
*JUN 1-JUL 3.79	1.	1994.	66.09	50.00	4.07	3.90	6.70	0.672	0.743	0.20	0.67	0.10	0.11
*JUL 3-AUG 3.79	1.	2012.	66.65	31.00	6.13	*****	6.10	0.734	0.705	0.33	2.96	0.28	0.09
*AUG 3-SEP 6.79	1.	3191.	105.76	34.60	3.99	3.90	4.10	0.560	0.291	0.24	0.35	0.10	0.10
*SEP 6-OCT 1.79	***	816.	26.91	45.20	3.95	2.00	7.80	0.550	0.910	0.40	0.80	0.29	0.05
OCT31-NOV29.79	***	1439.	54.27	34.60	4.12	3.48	2.51	0.470	0.324	0.11	0.20	0.04	0.05
*NOV29-JAN 7.80	***	1333.	44.18	23.30	4.75	2.65	3.63	0.781	0.425	2.85	1.20	0.06	0.10
*JAN 7-JAN31.80	***	1223.	40.53	22.60	5.10	*****	5.10	0.690	0.401	0.70	1.88	0.06	0.10
FEB29-APR 2.80	***	1482.	49.12	35.40	4.23	*****	3.00	0.640	0.265	0.20	0.50	0.20	0.10
*APR 2-APR30.80	***	1961.	64.99	29.60	4.30	2.20	3.00	0.530	0.348	0.38	0.53	0.15	< 0.20
*APR30-JUN 4.80	***	2205.	73.08	23.80	4.45	1.40	3.20	0.380	0.338	0.13	0.64	0.12	< 0.20

PERIOD	N-ISN	FE	MN	PB	CU	NI (MG/L)	P=	ZN	AL	CD	MN	V
*JUN 1-JUL 3.79	0.824	0.0060	0.11	0.013	0.0160	< 0.0010	0.015	0.010	******	0.0003	*******	******
*JUL 3-AUG 3.79	0.710	0.0400	0.63	0.006	0.0110	< 0.0010	0.002	0.014	******	< 0.0001	*******	******
*AUG 3-SEP 6.79	0.540	0.0140	0.07	0.014	0.0100	< 0.0010	0.006	0.010	******	0.0010	*******	******
*SEP 6-OCT 1.79	2.120	0.2000	0.18	0.018	0.0130	< 0.0005	0.010	0.011	******	0.0003	*******	******
OCT31-NOV29.79	0.411	0.0030	0.03	0.014	0.0160	< 0.0005	0.060	0.004	******	0.0002	*******	******
*NOV29-JAN 7.80	0.545	0.0060	0.28	0.011	0.0240	0.0010	0.003	0.014	******	0.0004	*******	******
*JAN 7-JAN31.80	0.564	0.0030	0.41	0.018	0.0150	< 0.0005	0.006	0.013	******	0.0006	*******	******
FEB29-APR 2.80	0.510	0.0030	0.11	0.019	0.0150	< 0.0005	0.013	0.012	******	0.0001	*******	******
*APR 2-APR30.80	0.490	0.0100	0.06	0.013	0.0045	< 0.0005	0.006	0.008	******	0.0001	*******	******
*APR30-JUN 4.80	0.482	0.0050	0.12	0.018	0.0040	0.0005	0.005	0.005	******	0.0001	*******	******

FOR TYPE: 1-RAIN,2-SNOW. ***** -- NOT DETERMINED * -- EXCLUDED IN COMPARISON

Appendix 2-4

APOS Precision Measurements at Burwash

INTERCOMPARISON (APOS)
PAIR-WISE T-TEST : SIGNIFICANCE LEVEL = .05

WET SAMPLING RESULTS :
UNITS - MG/L , UNLESS OTHERWISE NOTED

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
VOLUME (L)	BURWASH1	1.761	0.696	0.3278	0.472	8.	2.0841	2.3060	T
	BURWASH2	1.433	0.858						
CON	BURWASH1	35.514	13.568	0.3571	3.770	6.	0.2507	2.4470	T
	BURWASH2	35.157	12.164						
PH	BURWASH1	4.251	0.466	-0.0287	0.199	7.	-0.4087	2.3650	T
	BURWASH2	4.280	0.360						
ACIDITY	BURWASH1	5.210	1.827	-0.1614	1.220	6.	-0.3502	2.4470	T
	BURWASH2	5.371	2.115						
SO4	BURWASH1	3.500	1.537	0.0313	0.661	7.	0.1337	2.3650	T
	BURWASH2	3.469	1.692						
N-NO3	BURWASH1	0.630	0.261	0.0538	0.190	7.	0.7994	2.3650	T
	BURWASH2	0.576	0.229						
N-NH4	BURWASH1	0.368	0.137	-0.0133	0.077	7.	-0.4854	2.3650	T
	BURWASH2	0.381	0.161						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CL	BURWASH1	0.306	0.261	-0.1437	0.258	7.	-1.5789	2.3650	T
	BURWASH2	0.450	0.427						
CA	BURWASH1	0.222	0.149	-0.0262	0.079	7.	-0.9431	2.3650	T
	BURWASH2	0.249	0.172						
K	BURWASH1	0.061	0.075	-0.0425	0.093	7.	-1.2904	2.3650	T
	BURWASH2	0.104	0.161						
NA	BURWASH1	0.172	0.197	-0.0875	0.157	7.	-1.5727	2.3650	T
	BURWASH2	0.260	0.275						
N-TKN	BURWASH1	0.476	0.138	-0.1086	0.135	6.	-2.1265	2.4470	T
	BURWASH2	0.584	0.190						
TP	BURWASH1	0.004	0.003	-0.0033	0.007	6.	-1.2784	2.4470	T
	BURWASH2	0.007	0.006						
MG	BURWASH1	0.0350	0.0273	-0.0262	0.070	7.	-1.0532	2.3650	T
	BURWASH2	0.0612	0.0854						
FE	BURWASH1	0.0427	0.0212	-0.0104	0.013	6.	-2.0820	2.4470	T
	BURWASH2	0.0531	0.0284						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CU	BURWASH1	0.0050	0.0037	-0.0040	0.005	6.	-2.1602	2.4470	T
	BURWASH2	0.0090	0.0082						
NI	BURWASH1	0.0020	0.0018	-0.0001	0.002	6.	-0.1615	2.4470	T
	BURWASH2	0.0021	0.0011						
PB	BURWASH1	0.0126	0.0049	0.0000	0.005	6.	0.0000	2.4470	T
	BURWASH2	0.0126	0.0036						
ZN	BURWASH1	0.0120	0.0077	-0.0150	0.029	6.	-1.3907	2.4470	T
	BURWASH2	0.0270	0.0300						
AL	BURWASH1	0.0326	0.0152	0.0034	0.015	6.	0.5931	2.4470	T
	BURWASH2	0.0291	0.0120						
CD	BURWASH1	0.0006	0.0005	-0.0004	0.001	3.	-0.9820	3.1820	T
	BURWASH2	0.0011	0.0014						
MN	BURWASH1	0.0036	0.0016	-0.0011	0.001	6.	-2.0656	2.4470	T
	BURWASH2	0.0047	0.0021						
V	BURWASH1	0.0031	0.0019	0.0	0.003	6.	N/A	2.4470	N/A
	BURWASH2	0.0031	0.0019						

INTERCOMPARISON (APOS)
PAIR-WISE T-TEST : SIGNIFICANCE LEVEL = .05

WET SAMPLING RESULTS :
UNITS - MG/L , UNLESS OTHERWISE NOTED

SUMMER OBSERVATIONS : MAY - OCTOBER

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
VOLUME (L)	BURWASH1	2.215	0.395	0.1600	0.053	2.	5.2373	4.3030	F
	BURWASH2	2.055	0.384						
CON	BURWASH1	44.533	8.784	1.6333	4.537	2.	0.6236	4.3030	T
	BURWASH2	42.900	11.867						
PH	BURWASH1	4.047	0.133	-0.0600	0.171	2.	-0.6092	4.3030	T
	BURWASH2	4.107	0.267						
ACIDITY	BURWASH1	6.313	1.404	-0.2133	2.040	2.	-0.1811	4.3030	T
	BURWASH2	6.527	2.631						
SO4	BURWASH1	4.933	1.114	-0.2000	0.260	2.	-1.3333	4.3030	T
	BURWASH2	5.133	1.277						
N-NO3	BURWASH1	0.690	0.231	0.0200	0.072	2.	0.4804	4.3030	T
	BURWASH2	0.670	0.282						
N-NH4	BURWASH1	0.467	0.171	0.0067	0.045	2.	0.2561	4.3030	T
	BURWASH2	0.460	0.212						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CL	BURWASH1	0.137	0.072	-0.1100	0.156	2.	-1.2197	4.3030	T
	BURWASH2	0.247	0.135						
CA	BURWASH1	0.347	0.194	-0.0733	0.087	2.	-1.4538	4.3030	T
	BURWASH2	0.420	0.166						
K	BURWASH1	0.037	0.021	-0.0433	0.049	2.	-1.5215	4.3030	T
	BURWASH2	0.080	0.046						
NA	BURWASH1	0.043	0.040	-0.0567	0.081	2.	-1.2143	4.3030	T
	BURWASH2	0.100	0.070						
N-TKN	BURWASH1	0.527	0.188	-0.0867	0.090	2.	-1.6748	4.3030	T
	BURWASH2	0.613	0.099						
TP	BURWASH1	0.002	0.002	-0.0063	0.009	2.	-1.1806	4.3030	T
	BURWASH2	0.009	0.008						
MG	BURWASH1	0.0633	0.0252	-0.0700	0.113	2.	-1.0759	4.3030	T
	BURWASH2	0.1333	0.1137						
FE	BURWASH1	0.0377	0.0230	-0.0043	0.010	2.	-0.7647	4.3030	T
	BURWASH2	0.0420	0.0140						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CU	BURWASH1	0.0033	0.0006	-0.0040	0.002	2.	-3.4641	4.3030	T
	BURWASH2	0.0073	0.0025						
NI	BURWASH1	0.0010	0.0000	-0.0007	0.001	2.	-2.0000	4.3030	T
	BURWASH2	0.0017	0.0006						
PB	BURWASH1	0.0120	0.0046	-0.0027	0.002	2.	-3.0237	4.3030	T
	BURWASH2	0.0147	0.0046						
ZN	BURWASH1	0.0090	0.0026	-0.0240	0.043	2.	-0.9597	4.3030	T
	BURWASH2	0.0330	0.0407						
AL	BURWASH1	0.0410	0.0145	0.0130	0.021	2.	1.0974	4.3030	T
	BURWASH2	0.0280	0.0062						
CD	NO DATA PAIRS								
MN	BURWASH1	0.0047	0.0015	-0.0003	0.001	2.	-1.0000	4.3030	T
	BURWASH2	0.0050	0.0020						
V	BURWASH1	0.0020	0.0000	0.0	0.0	2.	N/A	4.3030	N/A
	BURWASH2	0.0020	0.0000						

INTERCOMPARISON (APOS)
PAIR-WISE T-TEST : SIGNIFICANCE LEVEL = .05

WET SAMPLING RESULTS :
UNITS - MG/L , UNLESS OTHERWISE NOTED

WINTER OBSERVATIONS : NOVEMBER - APRIL

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
VOLUME (L)	BURWASH1	1.533	0.726	0.4117	0.574	5.	1.7561	2.5710	T
	BURWASH2	1.122	0.878						
CON	BURWASH1	28.750	13.205	-0.6000	3.442	3.	-0.3486	3.1820	T
	BURWASH2	29.350	9.855						
PH	BURWASH1	4.374	0.566	-0.0100	0.231	4.	-0.0966	2.7760	T
	BURWASH2	4.384	0.395						
ACIDITY	BURWASH1	4.382	1.797	-0.1225	0.443	3.	-0.5533	3.1820	T
	BURWASH2	4.505	1.411						
SO4	BURWASH1	2.640	1.024	0.1700	0.817	4.	0.4654	2.7760	T
	BURWASH2	2.470	0.931						
N-NO3	BURWASH1	0.594	0.298	0.0740	0.244	4.	0.6793	2.7760	T
	BURWASH2	0.520	0.203						
N-NH4	BURWASH1	0.309	0.082	-0.0252	0.095	4.	-0.5959	2.7760	T
	BURWASH2	0.334	0.124						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CL	BURWASH1	0.408	0.287	-0.1640	0.320	4.	-1.1455	2.7760	T
	BURWASH2	0.572	0.510						
CA	BURWASH1	0.148	0.040	0.0020	0.066	4.	0.0677	2.7760	T
	BURWASH2	0.146	0.051						
K	BURWASH1	0.076	0.094	-0.0420	0.118	4.	-0.7946	2.7760	T
	BURWASH2	0.118	0.208						
NA	BURWASH1	0.250	0.217	-0.1060	0.197	4.	-1.2013	2.7760	T
	BURWASH2	0.356	0.314						
N-TKN	BURWASH1	0.437	0.101	-0.1250	0.174	3.	-1.4362	3.1820	T
	BURWASH2	0.562	0.254						
TP	BURWASH1	0.005	0.003	-0.0010	0.004	3.	-0.4629	3.1820	T
	BURWASH2	0.006	0.005						
MG	BURWASH1	0.0180	0.0045	-0.0000	0.007	4.	-0.0000	2.7760	T
	BURWASH2	0.0180	0.0084						
FE	BURWASH1	0.0465	0.0223	-0.0150	0.015	3.	-2.0135	3.1820	T
	BURWASH2	0.0615	0.0356						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CU	BURWASH1	0.0062	0.0048	-0.0040	0.007	3.	-1.1882	3.1820	T
	BURWASH2	0.0102	0.0112						
NI	BURWASH1	0.0027	0.0022	0.0002	0.003	3.	0.1562	3.1820	T
	BURWASH2	0.0025	0.0013						
PB	BURWASH1	0.0130	0.0057	0.0020	0.007	3.	0.5898	3.1820	T
	BURWASH2	0.0110	0.0022						
ZN	BURWASH1	0.0142	0.0098	-0.0082	0.015	3.	-1.0735	3.1820	T
	BURWASH2	0.0225	0.0251						
AL	BURWASH1	0.0262	0.0141	-0.0038	0.005	3.	-1.4456	3.1820	T
	BURWASH2	0.0300	0.0161						
CD	BURWASH1	0.0006	0.0005	-0.0004	0.001	3.	-0.9820	3.1820	T
	BURWASH2	0.0011	0.0014						
MN	BURWASH1	0.0027	0.0013	-0.0017	0.002	3.	-2.0494	3.1820	T
	BURWASH2	0.0045	0.0024						
V	BURWASH1	0.0039	0.0022	0.0	0.004	3.	N/A	3.1820	N/A
	BURWASH2	0.0039	0.0022						

Appendix 2-5

CANSAP Precision Measurements at Burwash

INTERCOMPARISON (CANSAP)
PAIR-WISE T-TEST : SIGNIFICANCE LEVEL = .05

WET SAMPLING RESULTS :
UNITS - MG/L , UNLESS OTHERWISE NOTED

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
VOLUME (L)	BURWASH1	1.817	0.687	0.0651	0.183	8.	1.0685	2.3060	T
	BURWASH2	1.752	0.656						
CON	BURWASH1	37.911	13.610	-3.6333	5.048	8.	-2.1593	2.3060	T
	BURWASH2	41.544	13.489						
PH	BURWASH1	4.262	0.119	0.0625	0.052	7.	3.4156	2.3650	F
	BURWASH2	4.200	0.142						
ACIDITY	BURWASH1	3.379	1.397	-0.2000	0.508	8.	-1.1802	2.3060	T
	BURWASH2	3.579	1.523						
SO4	BURWASH1	3.318	1.572	-0.7011	1.644	8.	-1.2792	2.3060	T
	BURWASH2	4.019	2.314						
N-NO3	BURWASH1	0.641	0.245	-0.0642	0.129	8.	-1.4981	2.3060	T
	BURWASH2	0.705	0.203						
N-NH4	BURWASH1	0.306	0.168	-0.1478	0.307	8.	-1.4450	2.3060	T
	BURWASH2	0.454	0.306						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CL	BURWASH1	0.877	1.028	-0.0022	0.383	8.	-0.0174	2.3060	T
	BURWASH2	0.879	1.214						
CA	BURWASH1	0.463	0.367	0.0167	0.193	8.	0.2587	2.3060	T
	BURWASH2	0.447	0.233						
K	BURWASH1	0.142	0.131	-0.0522	0.166	8.	-0.9457	2.3060	T
	BURWASH2	0.194	0.212						
NA	BURWASH1	0.488	0.592	0.0589	0.222	8.	0.7952	2.3060	T
	BURWASH2	0.429	0.654						
N-TKN	NO DATA PAIRS								
TP	BURWASH1	0.019	0.018	-0.0197	0.076	8.	-0.7741	2.3060	T
	BURWASH2	0.039	0.069						
MG	BURWASH1	0.0622	0.0427	-0.0111	0.069	8.	-0.4844	2.3060	T
	BURWASH2	0.0733	0.0682						
FE	BURWASH1	0.0109	0.0056	-0.0001	0.006	8.	-0.0567	2.3060	T
	BURWASH2	0.0110	0.0053						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CU	BURWASH1	0.0081	0.0037	-0.0021	0.006	8.	-1.0396	2.3060	T
	BURWASH2	0.0102	0.0081						
NI	BURWASH1	0.0026	0.0021	-0.0009	0.003	8.	-1.0371	2.3060	T
	BURWASH2	0.0035	0.0041						
PB	BURWASH1	0.0144	0.0073	0.0018	0.004	8.	1.3152	2.3060	T
	BURWASH2	0.0127	0.0048						
ZN	BURWASH1	0.0174	0.0162	-0.0012	0.012	8.	-0.3168	2.3060	T
	BURWASH2	0.0187	0.0167						
AL	NO DATA PAIRS								
CD	BURWASH1	0.0017	0.0014	-0.0019	0.003	8.	-1.9036	2.3060	T
	BURWASH2	0.0036	0.0035						
MN	NO DATA PAIRS								
V	NO DATA PAIRS								

INTERCOMPARISON (CANSAP)
PAIR-WISE T-TEST : SIGNIFICANCE LEVEL = .05

WET SAMPLING RESULTS :
UNITS - MG/L ; UNLESS OTHERWISE NOTED

SUMMER OBSERVATIONS : MAY - OCTOBER

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
VOLUME (L)	BURWASH1	2.016	0.344	0.1560	0.231	2.	1.1690	4.3030	T
	BURWASH2	1.860	0.401						
CON	BURWASH1	47.867	20.312	-7.6000	6.589	2.	-1.9979	4.3030	T
	BURWASH2	55.467	14.472						
PH	BURWASH1	4.250	0.212	0.0500	0.071	1.	1.0000	12.7060	T
	BURWASH2	4.200	0.283						
ACIDITY	BURWASH1	4.333	2.303	-0.2667	0.153	2.	-3.0237	4.3030	T
	BURWASH2	4.600	2.400						
SO4	BURWASH1	4.933	1.848	-2.1000	2.516	2.	-1.4457	4.3030	T
	BURWASH2	7.033	0.681						
N-NO3	BURWASH1	0.597	0.326	-0.1467	0.193	2.	-1.3130	4.3030	T
	BURWASH2	0.743	0.255						
N-NH4	BURWASH1	0.406	0.211	-0.3920	0.485	2.	-1.4000	4.3030	T
	BURWASH2	0.798	0.299						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CL	BURWASH1	0.153	0.081	-0.1000	0.140	2.	-1.2372	4.3030	T
	BURWASH2	0.253	0.061						
CA	BURWASH1	0.397	0.319	-0.1000	0.210	2.	-0.8248	4.3030	T
	BURWASH2	0.497	0.191						
K	BURWASH1	0.063	0.025	-0.1433	0.240	2.	-1.0359	4.3030	T
	BURWASH2	0.207	0.220						
NA	BURWASH1	0.087	0.065	-0.0133	0.065	2.	-0.3549	4.3030	T
	BURWASH2	0.100	0.000						
N-TKN	NO DATA PAIRS								
TP	BURWASH1	0.006	0.002	-0.0850	0.114	2.	-1.2875	4.3030	T
	BURWASH2	0.091	0.114						
MG	BURWASH1	0.0833	0.0757	-0.0600	0.113	2.	-0.9222	4.3030	T
	BURWASH2	0.1433	0.0862						
FE	BURWASH1	0.0090	0.0044	-0.0013	0.007	2.	-0.3393	4.3030	T
	BURWASH2	0.0103	0.0055						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CU	BURWASH1	0.0070	0.0061	-0.0023	0.002	2.	-1.7500	4.3030	T
	BURWASH2	0.0093	0.0051						
NI	BURWASH1	0.0008	0.0003	0.0	0.0	2.	N/A	4.3030	N/A
	BURWASH2	0.0008	0.0003						
PB	BURWASH1	0.0120	0.0053	-0.0007	0.003	2.	-0.4588	4.3030	T
	BURWASH2	0.0127	0.0035						
ZN	BURWASH1	0.0060	0.0010	-0.0053	0.008	2.	-1.2200	4.3030	T
	BURWASH2	0.0113	0.0068						
AL	NO DATA PAIRS								
CD	BURWASH1	0.0010	0.0000	0.0	0.0	2.	N/A	4.3030	N/A
	BURWASH2	0.0010	0.0000						
MN	NO DATA PAIRS								
V	NO DATA PAIRS								

INTERCOMPARISON (CANSAP)
PAIR-WISE T-TEST : SIGNIFICANCE LEVEL = .05

WET SAMPLING RESULTS :
UNITS - MG/L , UNLESS OTHERWISE NOTED

WINTER OBSERVATIONS : NOVEMBER - APRIL

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
VOLUME (L)	BURWASH1	1.717	0.819	0.0197	0.157	5.	0.3068	2.5710	T
	BURWASH2	1.697	0.784						
CON	BURWASH1	32.933	6.493	-1.6500	3.041	5.	-1.3291	2.5710	T
	BURWASH2	34.583	5.738						
PH	BURWASH1	4.267	0.103	0.0667	0.052	5.	3.1623	2.5710	F
	BURWASH2	4.200	0.110						
ACIDITY	BURWASH1	2.902	0.423	-0.1667	0.633	5.	-0.6453	2.5710	T
	BURWASH2	3.068	0.685						
SO4	BURWASH1	2.510	0.489	-0.0017	0.180	5.	-0.0227	2.5710	T
	BURWASH2	2.512	0.448						
N-NO3	BURWASH1	0.662	0.229	-0.0230	0.073	5.	-0.7685	2.5710	T
	BURWASH2	0.685	0.197						
N-NH4	BURWASH1	0.257	0.136	-0.0257	0.053	5.	-1.1761	2.5710	T
	BURWASH2	0.282	0.089						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CL	BURWASH1	1.238	1.104	0.0467	0.468	5.	0.2444	2.5710	T
	BURWASH2	1.192	1.415						
CA	BURWASH1	0.497	0.413	0.0750	0.173	5.	1.0630	2.5710	T
	BURWASH2	0.422	0.264						
K	BURWASH1	0.182	0.146	-0.0067	0.116	5.	-0.1407	2.5710	T
	BURWASH2	0.188	0.229						
NA	BURWASH1	0.688	0.644	0.0950	0.269	5.	0.8637	2.5710	T
	BURWASH2	0.593	0.766						
N-TKN	NO DATA PAIRS								
TP	BURWASH1	0.026	0.019	0.0130	0.015	5.	2.1333	2.5710	T
	BURWASH2	0.013	0.007						
MG	BURWASH1	0.0517	0.0147	0.0133	0.019	5.	1.7541	2.5710	T
	BURWASH2	0.0383	0.0075						
FE	BURWASH1	0.0118	0.0063	0.0005	0.006	5.	0.2056	2.5710	T
	BURWASH2	0.0113	0.0056						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CU	BURWASH1	0.0087	0.0024	-0.0020	0.008	5.	-0.6478	2.5710	T
	BURWASH2	0.0107	0.0097						
NI	BURWASH1	0.0035	0.0021	-0.0013	0.003	5.	-1.0398	2.5710	T
	BURWASH2	0.0048	0.0045						
PB	BURWASH1	0.0157	0.0083	0.0030	0.004	5.	1.7131	2.5710	T
	BURWASH2	0.0127	0.0056						
ZN	BURWASH1	0.0232	0.0173	0.0008	0.013	5.	0.1538	2.5710	T
	BURWASH2	0.0223	0.0194						
AL	NO DATA PAIRS								
CD	BURWASH1	0.0020	0.0017	-0.0028	0.003	5.	-2.0957	2.5710	T
	BURWASH2	0.0048	0.0037						
MN	NO DATA PAIRS								
V	NO DATA PAIRS								

INTERCOMPARISON (CANSAP)
PAIR-WISE T-TEST : SIGNIFICANCE LEVEL = .05

WET SAMPLING RESULTS :
UNITS - MG/L , UNLESS OTHERWISE NOTED

PERIOD : MAY - DEC. 1979

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
VOLUME (L)	BURWASH1	1.906	0.566	0.1326	0.220	4.	1.3499	2.7760	T
	BURWASH2	1.773	0.462						
CON	BURWASH1	42.400	16.708	-4.2800	6.540	4.	-1.4633	2.7760	T
	BURWASH2	46.680	16.490						
PH	BURWASH1	4.200	0.142	0.0500	0.058	3.	1.7320	3.1820	T
	BURWASH2	4.150	0.192						
ACIDITY	BURWASH1	3.762	1.834	-0.3000	0.319	4.	-2.1009	2.7760	T
	BURWASH2	4.062	1.949						
SO4	BURWASH1	3.960	1.931	-1.2000	2.167	4.	-1.2384	2.7760	T
	BURWASH2	5.160	2.639						
N-NO3	BURWASH1	0.660	0.267	-0.0700	0.173	4.	-0.9060	2.7760	T
	BURWASH2	0.730	0.214						
N-NH4	BURWASH1	0.363	0.162	-0.2396	0.401	4.	-1.3346	2.7760	T
	BURWASH2	0.602	0.342						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CL	BURWASH1	0.346	0.394	0.1260	0.415	4.	0.6790	2.7760	T
	BURWASH2	0.220	0.069						
CA	BURWASH1	0.598	0.455	0.0500	0.259	4.	0.4318	2.7760	T
	BURWASH2	0.548	0.276						
K	BURWASH1	0.104	0.084	-0.0540	0.212	4.	-0.5697	2.7760	T
	BURWASH2	0.158	0.171						
NA	BURWASH1	0.284	0.299	0.1440	0.251	4.	1.2831	2.7760	T
	BURWASH2	0.140	0.055						
N-TKN	NO DATA PAIRS								
TP	BURWASH1	0.013	0.012	-0.0460	0.097	4.	-1.0603	2.7760	T
	BURWASH2	0.059	0.092						
MG	BURWASH1	0.0760	0.0546	-0.0240	0.094	4.	-0.5727	2.7760	T
	BURWASH2	0.1000	0.0851						
FE	BURWASH1	0.0116	0.0066	0.0008	0.007	4.	0.2386	2.7760	T
	BURWASH2	0.0108	0.0040						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CU	BURWASH1	0.0072	0.0043	-0.0006	0.003	4.	-0.4523	2.7760	T
	BURWASH2	0.0078	0.0043						
NI	BURWASH1	0.0019	0.0018	0.0002	0.001	4.	0.4082	2.7760	T
	BURWASH2	0.0017	0.0012						
PB	BURWASH1	0.0144	0.0070	0.0022	0.005	4.	0.9183	2.7760	T
	BURWASH2	0.0122	0.0031						
ZN	BURWASH1	0.0134	0.0149	0.0026	0.015	4.	0.3985	2.7760	T
	BURWASH2	0.0108	0.0056						
AL	NO DATA PAIRS								
CD	BURWASH1	0.0014	0.0009	-0.0028	0.004	4.	-1.6059	2.7760	T
	BURWASH2	0.0042	0.0044						
MN	NO DATA PAIRS								
V	NO DATA PAIRS								

INTERCOMPARISON (CANSAP)
PAIR-WISE T-TEST : SIGNIFICANCE LEVEL = .05

WET SAMPLING RESULTS :
UNITS - MG/L , UNLESS OTHERWISE NOTED

PERIOD : JAN - APR, 1980

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
VOLUME (L)	BURWASH1	1.705	0.895	-0.0192	0.088	3.	-0.4385	3.1820	T
	BURWASH2	1.725	0.928						
CON	BURWASH1	32.300	6.799	-2.8250	3.058	3.	-1.8478	3.1820	T
	BURWASH2	35.125	4.875						
PH	BURWASH1	4.325	0.050	0.0750	0.050	3.	3.0000	3.1820	T
	BURWASH2	4.250	0.058						
ACIDITY	BURWASH1	2.900	0.408	-0.0750	0.718	3.	-0.2089	3.1820	T
	BURWASH2	2.975	0.499						
SO4	BURWASH1	2.515	0.268	-0.0775	0.127	3.	-1.2244	3.1820	T
	BURWASH2	2.592	0.326						
N-NO3	BURWASH1	0.616	0.254	-0.0570	0.065	3.	-1.7627	3.1820	T
	BURWASH2	0.673	0.217						
N-NH4	BURWASH1	0.236	0.168	-0.0330	0.067	3.	-0.9790	3.1820	T
	BURWASH2	0.269	0.108						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CL	BURWASH1	1.540	1.248	-0.1625	0.317	3.	-1.0242	3.1820	T
	BURWASH2	1.702	1.515						
CA	BURWASH1	0.295	0.124	-0.0250	0.078	3.	-0.6437	3.1820	T
	BURWASH2	0.320	0.066						
K	BURWASH1	0.190	0.175	-0.0500	0.115	3.	-0.8682	3.1820	T
	BURWASH2	0.240	0.275						
NA	BURWASH1	0.742	0.812	-0.0475	0.143	3.	-0.6636	3.1820	T
	BURWASH2	0.790	0.907						
N-TKN	NO DATA PAIRS								
TP	BURWASH1	0.028	0.023	0.0132	0.019	3.	1.4310	3.1820	T
	BURWASH2	0.014	0.008						
MG	BURWASH1	0.0450	0.0129	0.0050	0.017	3.	0.5774	3.1820	T
	BURWASH2	0.0400	0.0082						
FE	BURWASH1	0.0100	0.0049	-0.0013	0.004	3.	-0.6623	3.1820	T
	BURWASH2	0.0113	0.0073						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CU	BURWASH1	0.0093	0.0029	-0.0040	0.009	3.	-0.9020	3.1820	T
	BURWASH2	0.0133	0.0113						
NI	BURWASH1	0.0035	0.0024	-0.0022	0.003	3.	-1.3222	3.1820	T
	BURWASH2	0.0057	0.0056						
PB	BURWASH1	0.0145	0.0087	0.0013	0.002	3.	1.1275	3.1820	T
	BURWASH2	0.0132	0.0068						
ZN	BURWASH1	0.0225	0.0184	-0.0060	0.004	3.	-2.7775	3.1820	T
	BURWASH2	0.0285	0.0216						
AL	NO DATA PAIRS								
CD	BURWASH1	0.0020	0.0020	-0.0008	0.000	3.	-3.0000	3.1820	T
	BURWASH2	0.0027	0.0022						
MN	NO DATA PAIRS								
V	NO DATA PAIRS								

Appendix 2-6

GLPN (CCIW) Precision Measurements at Burwash

INTERCOMPARISON (CCIW)
PAIR-WISE T-TEST : SIGNIFICANCE LEVEL = .05

WET SAMPLING RESULTS :
UNITS - MG/L , UNLESS OTHERWISE NOTED

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
VOLUME (L)	BURWASH1	1.680	0.584	0.0423	0.117	8.	1.0900	2.3060	T
	BURWASH2	1.638	0.618						
CON	BURWASH1	40.444	9.050	-4.5444	8.015	8.	-1.7010	2.3060	T
	BURWASH2	44.989	11.524						
PH	BURWASH1	4.071	0.152	0.0389	0.079	8.	1.4686	2.3060	T
	BURWASH2	4.032	0.158						
ACIDITY	BURWASH1	3.948	1.169	-0.5767	1.087	8.	-1.5917	2.3060	T
	BURWASH2	4.524	1.214						
SO4	BURWASH1	3.602	1.754	-0.0344	0.323	8.	-0.3197	2.3060	T
	BURWASH2	3.637	1.644						
N-NO3	BURWASH1	0.705	0.234	-0.0367	0.058	8.	-1.8935	2.3060	T
	BURWASH2	0.741	0.244						
N-NH4	BURWASH1	0.354	0.138	0.0122	0.098	8.	0.3760	2.3060	T
	BURWASH2	0.342	0.170						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CL	BURWASH1	0.437	0.487	-0.1756	0.771	8.	-0.6835	2.3060	T
	BURWASH2	0.612	0.677						
CA	BURWASH1	0.378	0.207	-0.1422	0.512	8.	-0.8327	2.3060	T
	BURWASH2	0.520	0.710						
K	BURWASH1	0.069	0.038	0.0056	0.021	8.	0.8058	2.3060	T
	BURWASH2	0.063	0.047						
NA	BURWASH1	0.167	0.225	0.0022	0.100	8.	0.0666	2.3060	T
	BURWASH2	0.164	0.168						
N-TKN	BURWASH1	0.455	0.162	0.0038	0.079	8.	0.1434	2.3060	T
	BURWASH2	0.452	0.177						
TP	BURWASH1	0.004	0.003	-0.0004	0.005	8.	-0.2519	2.3060	T
	BURWASH2	0.005	0.004						
MG	BURWASH1	0.0411	0.0176	0.0044	0.014	8.	0.9363	2.3060	T
	BURWASH2	0.0367	0.0150						
FE	BURWASH1	0.0272	0.0117	0.0075	0.007	7.	2.9337	2.3650	F
	BURWASH2	0.0197	0.0094						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CU	BURWASH1	0.0147	0.0041	0.0006	0.007	7.	0.2244	2.3650	T
	BURWASH2	0.0142	0.0062						
NI	BURWASH1	0.0032	0.0049	-0.0034	0.011	7.	-0.8858	2.3650	T
	BURWASH2	0.0066	0.0155						
PB	BURWASH1	0.0105	0.0031	-0.0008	0.002	7.	-1.1578	2.3650	T
	BURWASH2	0.0112	0.0037						
ZN	BURWASH1	0.0071	0.0020	-0.0010	0.002	7.	-1.2140	2.3650	T
	BURWASH2	0.0081	0.0033						
AL	NO DATA PAIRS								
CD	BURWASH1	0.0003	0.0003	-0.0004	0.001	7.	-1.5986	2.3650	T
	BURWASH2	0.0008	0.0007						
MN	NO DATA PAIRS								
V	NO DATA PAIRS								

INTERCOMPARISON (CCIW)
PAIR-WISE T-TEST : SIGNIFICANCE LEVEL = .05

WET SAMPLING RESULTS :
UNITS - MG/L , UNLESS OTHERWISE NOTED

SUMMER OBSERVATIONS : MAY - OCTOBER

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
VOLUME (L)	BURWASH1	1.895	0.423	0.0913	0.129	2.	1.2303	4.3030	T
	BURWASH2	1.804	0.457						
CON	BURWASH1	50.433	7.072	-2.0667	1.290	2.	-2.7755	4.3030	T
	BURWASH2	52.500	6.394						
PH	BURWASH1	3.897	0.051	0.0	0.017	2.	0.0	4.3030	T
	BURWASH2	3.897	0.065						
ACIDITY	BURWASH1	5.200	1.179	0.2667	0.802	2.	0.5759	4.3030	T
	BURWASH2	4.933	0.808						
SO4	BURWASH1	5.867	0.513	0.1333	0.416	2.	0.5547	4.3030	T
	BURWASH2	5.733	0.896						
N-NO3	BURWASH1	0.800	0.358	-0.0400	0.017	2.	-4.0000	4.3030	T
	BURWASH2	0.840	0.365						
N-NH4	BURWASH1	0.507	0.138	-0.0013	0.059	2.	-0.0395	4.3030	T
	BURWASH2	0.508	0.182						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CL	BURWASH1	0.350	0.529	0.1067	0.298	2.	0.6192	4.3030	T
	BURWASH2	0.243	0.231						
CA	BURWASH1	0.337	0.074	0.0100	0.095	2.	0.1816	4.3030	T
	BURWASH2	0.327	0.140						
K	BURWASH1	0.067	0.015	-0.0067	0.031	2.	-0.3780	4.3030	T
	BURWASH2	0.073	0.040						
NA	BURWASH1	0.060	0.036	-0.0133	0.040	2.	-0.5714	4.3030	T
	BURWASH2	0.073	0.068						
N-TKN	BURWASH1	0.627	0.127	0.0160	0.078	2.	0.3557	4.3030	T
	BURWASH2	0.611	0.188						
TP	BURWASH1	0.007	0.004	0.0030	0.004	2.	1.4412	4.3030	T
	BURWASH2	0.004	0.001						
MG	BURWASH1	0.0533	0.0208	0.0033	0.025	2.	0.2294	4.3030	T
	BURWASH2	0.0500	0.0100						
FE	BURWASH1	0.0190	0.0079	0.0033	0.002	2.	3.7797	4.3030	T
	BURWASH2	0.0157	0.0090						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CU	BURWASH1	0.0150	0.0035	0.0020	0.002	2.	2.0000	4.3030	T
	BURWASH2	0.0130	0.0030						
NI	BURWASH1	0.0007	0.0003	-0.0002	0.000	2.	-1.0000	4.3030	T
	BURWASH2	0.0009	0.0003						
PB	BURWASH1	0.0107	0.0047	-0.0003	0.001	2.	-1.0000	4.3030	T
	BURWASH2	0.0110	0.0053						
ZN	BURWASH1	0.0070	0.0026	-0.0017	0.002	2.	-1.3868	4.3030	T
	BURWASH2	0.0087	0.0047						
AL	NO DATA PAIRS								
CD	BURWASH1	0.0001	0.0001	-0.0003	0.000	2.	-1.5000	4.3030	T
	BURWASH2	0.0004	0.0003						
MN	NO DATA PAIRS								
V	NO DATA PAIRS								

INTERCOMPARISON (CCIW)
PAIR-WISE T-TEST : SIGNIFICANCE LEVEL = .05

WET SAMPLING RESULTS :
UNITS - MG/L , UNLESS OTHERWISE NOTED

WINTER OBSERVATIONS : NOVEMBER - APRIL

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
VOLUME (L)	BURWASH1	1.573	0.658	0.0178	0.114	5.	0.3839	2.5710	T
	BURWASH2	1.555	0.709						
CON	BURWASH1	35.450	4.607	-5.7833	9.828	5.	-1.4414	2.5710	T
	BURWASH2	41.233	12.059						
PH	BURWASH1	4.158	0.093	0.0583	0.093	5.	1.5393	2.5710	T
	BURWASH2	4.100	0.147						
ACIDITY	BURWASH1	3.322	0.469	-0.9983	0.996	5.	-2.4542	2.5710	T
	BURWASH2	4.320	1.396						
SO4	BURWASH1	2.470	0.452	-0.1183	0.269	5.	-1.0765	2.5710	T
	BURWASH2	2.588	0.214						
N-NO3	BURWASH1	0.657	0.167	-0.0350	0.073	5.	-1.1810	2.5710	T
	BURWASH2	0.692	0.181						
N-NH4	BURWASH1	0.277	0.039	0.0190	0.117	5.	0.3979	2.5710	T
	BURWASH2	0.258	0.088						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CL	BURWASH1	0.460	0.510	-0.3167	0.918	5.	-0.8449	2.5710	T
	BURWASH2	0.797	0.768						
CA	BURWASH1	0.396	0.255	-0.2183	0.629	5.	-0.8504	2.5710	T
	BURWASH2	0.617	0.875						
K	BURWASH1	0.070	0.046	0.0117	0.013	5.	2.1500	2.5710	T
	BURWASH2	0.058	0.052						
NA	BURWASH1	0.220	0.265	0.0100	0.123	5.	0.1989	2.5710	T
	BURWASH2	0.210	0.130						
N-TKN	BURWASH1	0.370	0.096	-0.0023	0.086	5.	-0.0663	2.5710	T
	BURWASH2	0.372	0.114						
TP	BURWASH1	0.003	0.003	-0.0022	0.005	5.	-0.9861	2.5710	T
	BURWASH2	0.005	0.005						
MG	BURWASH1	0.0350	0.0138	0.0050	0.008	5.	1.4639	2.5710	T
	BURWASH2	0.0300	0.0126						
FE	BURWASH1	0.0322	0.0112	0.0100	0.008	4.	2.6822	2.7760	T
	BURWASH2	0.0222	0.0097						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CU	BURWASH1	0.0146	0.0048	-0.0003	0.009	4.	-0.0732	2.7760	T
	BURWASH2	0.0149	0.0078						
NI	BURWASH1	0.0048	0.0058	-0.0053	0.014	4.	-0.8579	2.7760	T
	BURWASH2	0.0101	0.0195						
PB	BURWASH1	0.0104	0.0024	-0.0010	0.002	4.	-0.9535	2.7760	T
	BURWASH2	0.0114	0.0030						
ZN	BURWASH1	0.0072	0.0019	-0.0006	0.003	4.	-0.5145	2.7760	T
	BURWASH2	0.0078	0.0027						
AL	NO DATA PAIRS								
CD	BURWASH1	0.0005	0.0003	-0.0005	0.001	4.	-1.1594	2.7760	T
	BURWASH2	0.0010	0.0008						
MN	NO DATA PAIRS								
V	NO DATA PAIRS								

Appendix 2-7

Intercomparison of APOS and CANSAP Data

APOS AND CANSAP INTERCOMPARISON
PAIR-WISE T-TEST : SIGNIFICANCE LEVEL = .05

WET SAMPLING RESULTS :
UNITS - MG/L , UNLESS OTHERWISE NOTED

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
VOLUME (L)	APOS	1.868	0.871	0.0005	0.862	31.	0.0033	2.0210	T
	CANSAP	1.867	1.061						
CON	APOS	37.716	13.736	-6.3710	8.875	30.	-3.9970	2.0420	F
	CANSAP	44.087	17.997						
PH	APOS	4.282	0.444	-0.0403	0.389	30.	-0.5767	2.0420	T
	CANSAP	4.323	0.425						
ACIDITY	APOS	5.572	1.749	1.7116	0.882	26.	10.0873	2.0560	F
	CANSAP	3.860	2.031						
SO4	APOS	3.911	1.710	-0.7444	1.309	31.	-3.2160	2.0210	F
	CANSAP	4.655	2.449						
N-NO3	APOS	0.715	0.350	-0.0957	0.188	30.	-2.8389	2.0420	F
	CANSAP	0.811	0.422						
N-NH4	APOS	0.424	0.158	-0.0167	0.245	30.	-0.3795	2.0420	T
	CANSAP	0.441	0.288						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CL	APOS	0.310	0.321	-0.5284	1.203	31.	-2.4839	2.0210	F
	CANSAP	0.839	1.464						
CA	APOS	0.349	0.421	-0.1857	0.357	29.	-2.8472	2.0450	F
	CANSAP	0.585	0.549						
K	APOS	0.042	0.027	-0.1639	0.269	30.	-3.3967	2.0420	F
	CANSAP	0.206	0.272						
NA	APOS	0.123	0.140	-0.1961	0.373	30.	-2.9255	2.0420	F
	CANSAP	0.319	0.433						
N-TKN	APOS	0.457	0.199	-0.1523	0.375	16.	-1.6761	2.1200	T
	CANSAP	0.609	0.348						
TP	APOS	0.035	0.162	-0.0038	0.175	29.	-0.1198	2.0450	T
	CANSAP	0.038	0.059						
MG	APOS	0.0758	0.0841	-0.0445	0.068	30.	-3.6662	2.0420	F
	CANSAP	0.1203	0.1380						
FE	APOS	0.0569	0.0499	0.0435	0.051	28.	4.5511	2.0480	F
	CANSAP	0.0134	0.0122						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CU	APOS	0.0040	0.0027	-0.0028	0.006	28.	-2.5555	2.0480	F
	CANSAP	0.0069	0.0056						
NI	APOS	0.0020	0.0021	0.0003	0.001	28.	1.8095	2.0480	T
	CANSAP	0.0015	0.0013						
PB	APOS	0.0132	0.0065	0.0007	0.005	28.	0.7381	2.0480	T
	CANSAP	0.0124	0.0070						
ZN	APOS	0.0170	0.0212	0.0029	0.020	28.	0.7680	2.0480	T
	CANSAP	0.0142	0.0133						
AL	APOS	0.0336	0.0274	0.0074	0.032	15.	0.9168	2.1310	T
	CANSAP	0.0261	0.0195						
CD	APOS	0.0011	0.0019	-0.0009	0.003	14.	-1.2096	2.1450	T
	CANSAP	0.0020	0.0022						
MN	APOS	0.0067	0.0039	-0.0010	0.004	15.	-1.0640	2.1310	T
	CANSAP	0.0077	0.0056						
V	NO DATA PAIRS								

APOS AND CANSAP INTERCOMPARISON
PAIR-WISE T-TEST : SIGNIFICANCE LEVEL = .05

WET SAMPLING RESULTS :
UNITS - MG/L , UNLESS OTHERWISE NOTED

SUMMER OBSERVATIONS : MAY - OCTOBER

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
VOLUME (L)	APOS	2.122	0.585	0.1847	1.179	13.	0.5860	2.1600	T
	CANSAP	1.938	1.015						
CON	APOS	40.693	16.735	-11.5500	9.506	13.	-4.5460	2.1600	F
	CANSAP	52.243	22.095						
PH	APOS	4.206	0.346	-0.0169	0.114	12.	-0.5371	2.1790	T
	CANSAP	4.223	0.327						
ACIDITY	APOS	5.948	2.110	1.5696	1.068	13.	5.4995	2.1600	F
	CANSAP	4.379	2.499						
SO4	APOS	4.700	1.843	-1.3714	1.541	13.	-3.3306	2.1600	F
	CANSAP	6.071	2.517						
N-NO3	APOS	0.635	0.295	-0.0916	0.189	13.	-1.8113	2.1600	T
	CANSAP	0.727	0.349						
N-NH4	APOS	0.451	0.198	-0.1296	0.287	13.	-1.6931	2.1600	T
	CANSAP	0.581	0.320						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CL	APOS	0.178	0.099	-0.0493	0.083	13.	-2.2226	2.1600	F
	CANSAP	0.227	0.127						
CA	APOS	0.417	0.189	-0.1914	0.318	13.	-2.2507	2.1600	F
	CANSAP	0.609	0.429						
K	APOS	0.053	0.034	-0.0564	0.083	13.	-2.5415	2.1600	F
	CANSAP	0.109	0.107						
NA	APOS	0.057	0.044	-0.0364	0.063	13.	-2.1778	2.1600	F
	CANSAP	0.094	0.055						
N-TKN	APOS	0.417	0.256	-0.2701	0.440	7.	-1.7366	2.3650	T
	CANSAP	0.687	0.397						
TP	APOS	0.069	0.236	0.0363	0.247	13.	0.5498	2.1600	T
	CANSAP	0.032	0.058						
MG	APOS	0.0843	0.0639	-0.0321	0.040	13.	-2.9757	2.1600	F
	CANSAP	0.1164	0.0680						
FE	APOS	0.0671	0.0601	0.0514	0.062	13.	3.1086	2.1600	F
	CANSAP	0.0157	0.0161						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CU	APOS	0.0043	0.0022	-0.0017	0.003	13.	-2.1965	2.1600	F
	CANSAP	0.0060	0.0042						
NI	APOS	0.0011	0.0004	0.0002	0.001	13.	1.4359	2.1600	T
	CANSAP	0.0009	0.0003						
PB	APOS	0.0138	0.0061	0.0012	0.005	13.	0.9436	2.1600	T
	CANSAP	0.0125	0.0071						
ZN	APOS	0.0147	0.0191	0.0047	0.017	13.	1.0349	2.1600	T
	CANSAP	0.0100	0.0068						
AL	APOS	0.0386	0.0213	0.0055	0.028	7.	0.5618	2.3650	T
	CANSAP	0.0331	0.0231						
CD	NO DATA PAIRS								
MN	APOS	0.0071	0.0025	-0.0011	0.003	7.	-1.1163	2.3650	T
	CANSAP	0.0082	0.0032						
V	NO DATA PAIRS								

APOS AND CANSAP INTERCOMPARISON
PAIR-WISE T-TEST : SIGNIFICANCE LEVEL = .05

WET SAMPLING RESULTS :
UNITS - MG/L , UNLESS OTHERWISE NOTED

WINTER OBSERVATIONS : NOVEMBER - APRIL

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
VOLUME (L)	APOS	1.670	1.014	-0.1428	0.490	17.	-1.2353	2.1100	T
	CANSAP	1.812	1.121						
CON	APOS	35.265	10.588	-2.1059	5.608	16.	-1.5482	2.1200	T
	CANSAP	37.371	10.222						
PH	APOS	4.337	0.506	-0.0572	0.508	17.	-0.4783	2.1100	T
	CANSAP	4.394	0.480						
ACIDITY	APOS	5.166	1.208	1.8646	0.632	12.	10.6301	2.1790	F
	CANSAP	3.302	1.234						
SO4	APOS	3.297	1.349	-0.2567	0.857	17.	-1.2700	2.1100	T
	CANSAP	3.554	1.777						
N-NO3	APOS	0.781	0.385	-0.0991	0.192	16.	-2.1256	2.1200	F
	CANSAP	0.880	0.473						
N-NH4	APOS	0.402	0.117	0.0763	0.160	16.	1.9647	2.1200	T
	CANSAP	0.326	0.201						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CL	APOS	0.413	0.394	-0.9011	1.517	17.	-2.5210	2.1100	F
	CANSAP	1.314	1.830						
CA	APOS	0.383	0.557	-0.1806	0.399	15.	-1.8130	2.1310	T
	CANSAP	0.564	0.649						
K	APOS	0.033	0.018	-0.2524	0.334	16.	-3.1194	2.1200	F
	CANSAP	0.285	0.338						
NA	APOS	0.176	0.168	-0.3276	0.466	16.	-2.8976	2.1200	F
	CANSAP	0.504	0.518						
N-TKN	APOS	0.492	0.137	-0.0476	0.292	8.	-0.4890	2.3060	T
	CANSAP	0.540	0.306						
TP	APOS	0.005	0.005	-0.0389	0.061	15.	-2.5375	2.1310	F
	CANSAP	0.044	0.062						
MG	APOS	0.0688	0.0991	-0.0547	0.084	16.	-2.6963	2.1200	F
	CANSAP	0.1235	0.1786						
FE	APOS	0.0473	0.0376	0.0361	0.040	14.	3.4701	2.1450	F
	CANSAP	0.0112	0.0067						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CU	APOS	0.0038	0.0031	-0.0039	0.004	14.	-1.9222	2.1450	T
	CANSAP	0.0077	0.0057						
NI	APOS	0.0029	0.0027	0.0007	0.002	14.	1.4044	2.1450	T
	CANSAP	0.0021	0.0016						
PB	APOS	0.0126	0.0070	0.0003	0.006	14.	0.1741	2.1450	T
	CANSAP	0.0123	0.0071						
ZN	APOS	0.0192	0.0234	0.0011	0.023	14.	0.1908	2.1450	T
	CANSAP	0.0181	0.0166						
AL	APOS	0.0285	0.0330	0.0094	0.038	7.	0.6890	2.3650	T
	CANSAP	0.0191	0.0130						
CD	APOS	0.0011	0.0019	-0.0009	0.003	14.	-1.2096	2.1450	T
	CANSAP	0.0020	0.0022						
MN	APOS	0.0064	0.0051	-0.0009	0.005	7.	-0.5262	2.3650	T
	CANSAP	0.0072	0.0076						
V	NO DATA PAIRS								

APOS AND CANSAP INTERCOMPARISON
PAIR-WISE T-TEST : SIGNIFICANCE LEVEL = .05

WET SAMPLING RESULTS :
UNITS - MG/L , UNLESS OTHERWISE NOTED

PERIOD : MAY - DEC, 1979

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
VOLUME (L)	APOS	2.141	0.664	0.0600	1.053	19.	0.2550	2.0930	T
	CANSAP	2.081	1.032						
CON	APOS	38.520	15.403	-10.0300	8.378	19.	-5.1543	2.0930	F
	CANSAP	48.550	20.340						
PH	APOS	4.219	0.343	0.0247	0.125	18.	0.8620	2.1010	T
	CANSAP	4.195	0.310						
ACIDITY	APOS	5.713	1.972	1.5517	0.904	19.	7.6727	2.0930	F
	CANSAP	4.161	2.287						
SO4	APOS	4.147	1.819	-1.2125	1.349	19.	-4.0188	2.0930	F
	CANSAP	5.360	2.465						
N-NO3	APOS	0.663	0.276	-0.0951	0.161	19.	-2.6443	2.0930	F
	CANSAP	0.758	0.324						
N-NH4	APOS	0.429	0.170	-0.1050	0.253	19.	-1.8585	2.0930	T
	CANSAP	0.534	0.287						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CL	APOS	0.203	0.118	-0.0695	0.221	19.	-1.4040	2.0930	T
	CANSAP	0.273	0.225						
CA	APOS	0.333	0.205	-0.2400	0.287	19.	-3.7455	2.0930	F
	CANSAP	0.573	0.374						
K	APOS	0.044	0.032	-0.0740	0.085	19.	-3.8905	2.0930	F
	CANSAP	0.118	0.099						
NA	APOS	0.073	0.072	-0.0830	0.167	19.	-2.2166	2.0930	F
	CANSAP	0.156	0.163						
N-TKN	APOS	0.424	0.209	-0.2350	0.388	11.	-2.1007	2.2010	T
	CANSAP	0.659	0.351						
TP	APOS	0.048	0.198	0.0146	0.209	19.	0.3119	2.0930	T
	CANSAP	0.034	0.054						
MG	APOS	0.0680	0.0590	-0.0310	0.035	19.	-3.9188	2.0930	F
	CANSAP	0.0990	0.0644						
FE	APOS	0.0596	0.0558	0.0451	0.057	19.	3.5119	2.0930	F
	CANSAP	0.0145	0.0140						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CU	APOS	0.0036	0.0022	-0.0022	0.003	19.	-3.3166	2.0930	F
	CANSAP	0.0058	0.0039						
NI	APOS	0.0012	0.0004	0.0000	0.001	19.	0.1811	2.0930	T
	CANSAP	0.0012	0.0006						
PB	APOS	0.0134	0.0055	-0.0000	0.005	19.	-0.0219	2.0930	T
	CANSAP	0.0135	0.0068						
ZN	APOS	0.0136	0.0160	0.0022	0.016	19.	0.6053	2.0930	T
	CANSAP	0.0114	0.0091						
AL	APOS	0.0324	0.0202	0.0022	0.023	11.	0.3267	2.2010	T
	CANSAP	0.0302	0.0195						
CD	APOS	0.0003	0.0002	-0.0025	0.003	5.	-2.0872	2.5710	T
	CANSAP	0.0028	0.0031						
MN	APOS	0.0070	0.0039	-0.0014	0.003	11.	-1.4563	2.2010	T
	CANSAP	0.0084	0.0062						
V	NO DATA PAIRS								

APOS AND CANSAP INTERCOMPARISON
PAIR-WISE T-TEST : SIGNIFICANCE LEVEL = .05

WET SAMPLING RESULTS :
UNITS - MG/L , UNLESS OTHERWISE NOTED

PERIOD : JAN - APR, 1980

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
VOLUME (L)	APOS	1.413	1.007	-0.0987	0.399	11.	-0.8565	2.2010	T
	CANSAP	1.512	1.055						
CON	APOS	36.255	10.566	0.2818	5.241	10.	0.1783	2.2280	T
	CANSAP	35.973	8.562						
PH	APOS	4.382	0.572	-0.1433	0.607	11.	-0.8175	2.2010	T
	CANSAP	4.525	0.512						
ACIDITY	APOS	5.169	0.830	2.1686	0.670	6.	8.5583	2.4470	F
	CANSAP	3.000	0.392						
SO4	APOS	3.517	1.500	0.0358	0.790	11.	0.1571	2.2010	T
	CANSAP	3.481	2.000						
N-NO3	APOS	0.810	0.455	-0.0968	0.239	10.	-1.3503	2.2280	T
	CANSAP	0.907	0.565						
N-NH4	APOS	0.416	0.141	0.1438	0.123	10.	3.8870	2.2280	F
	CANSAP	0.272	0.207						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CL	APOS	0.488	0.460	-1.2933	1.725	11.	-2.5971	2.2010	F
	CANSAP	1.782	2.099						
CA	APOS	0.540	0.673	-0.0770	0.467	9.	-0.5215	2.2620	T
	CANSAP	0.607	0.821						
K	APOS	0.037	0.018	-0.3273	0.396	10.	-2.7378	2.2280	F
	CANSAP	0.365	0.400						
NA	APOS	0.213	0.187	-0.4018	0.541	10.	-2.4638	2.2280	F
	CANSAP	0.615	0.602						
N-TKN	APOS	0.536	0.166	0.0462	0.281	4.	0.3683	2.7760	T
	CANSAP	0.490	0.349						
TP	APOS	0.007	0.004	-0.0406	0.070	9.	-1.8268	2.2620	T
	CANSAP	0.048	0.071						
MG	APOS	0.0900	0.1194	-0.0691	0.102	10.	-2.2574	2.2280	F
	CANSAP	0.1591	0.2160						
FE	APOS	0.0508	0.0353	0.0399	0.038	8.	3.1859	2.3060	F
	CANSAP	0.0109	0.0065						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CU	APOS	0.0049	0.0035	-0.0042	0.010	8.	-1.2654	2.3060	T
	CANSAP	0.0091	0.0081						
NI	APOS	0.0039	0.0031	0.0016	0.002	8.	2.0812	2.3060	T
	CANSAP	0.0023	0.0019						
PB	APOS	0.0126	0.0087	0.0024	0.006	8.	1.2260	2.3060	T
	CANSAP	0.0101	0.0071						
ZN	APOS	0.0247	0.0295	0.0043	0.028	8.	0.4658	2.3060	T
	CANSAP	0.0203	0.0189						
AL	APOS	0.0370	0.0472	0.0232	0.054	3.	0.8656	3.1820	T
	CANSAP	0.0137	0.0152						
CD	APOS	0.0016	0.0023	0.0001	0.003	8.	0.1225	2.3060	T
	CANSAP	0.0014	0.0013						
MN	APOS	0.0060	0.0045	0.0002	0.005	3.	0.0976	3.1820	T
	CANSAP	0.0057	0.0030						
V	NO DATA PAIRS								

Appendix 2-8

Intercomparison of APOS and GLPN (CCIW) Data

APOS AND CCIW INTERCOMPARISON
PAIR-WISE T-TEST : SIGNIFICANCE LEVEL = .05

WET SAMPLING RESULTS :
UNITS - MG/L , UNLESS OTHERWISE NOTED

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
VOLUME (L)	APOS	1.792	0.692	-0.0783	0.452	27.	-0.9179	2.0520	T
	CCIW	1.870	0.657						
CON	APOS	37.404	12.731	-3.1667	6.393	26.	-2.5738	2.0560	F
	CCIW	41.070	13.297						
PH	APOS	4.206	0.265	0.0444	0.357	26.	0.6469	2.0560	T
	CCIW	4.161	0.427						
ACIDITY	APOS	5.721	1.768	1.5083	1.482	23.	4.9845	2.0690	F
	CCIW	4.212	1.770						
SO4	APOS	4.080	1.367	0.0244	0.702	26.	0.1810	2.0560	T
	CCIW	4.055	1.606						
N-NO3	APOS	0.682	0.221	-0.0513	0.150	26.	-1.7775	2.0560	T
	CCIW	0.713	0.295						
N-NH4	APOS	0.459	0.173	0.0723	0.172	26.	2.1795	2.0560	F
	CCIW	0.387	0.215						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CL	APOS	0.244	0.130	-0.3663	0.689	26.	-2.7617	2.0560	F
	CCIW	0.610	0.718						
CA	APOS	0.381	0.223	-0.1396	0.534	26.	-1.3583	2.0560	T
	CCIW	0.521	0.474						
K	APOS	0.052	0.040	-0.1322	0.359	26.	-1.9118	2.0560	T
	CCIW	0.184	0.359						
NA	APOS	0.103	0.099	-0.0922	0.253	26.	-1.8944	2.0560	T
	CCIW	0.195	0.258						
N-TKN	APOS	0.590	0.202	0.0220	0.305	26.	0.3757	2.0560	T
	CCIW	0.568	0.354						
TP	APOS	0.015	0.026	-0.0021	0.054	26.	-0.2050	2.0560	T
	CCIW	0.017	0.046						
MG	APOS	0.0774	0.0599	0.0122	0.069	26.	0.9153	2.0560	T
	CCIW	0.0652	0.0511						
FE	APOS	0.0587	0.0480	0.0363	0.050	25.	3.7392	2.0600	F
	CCIW	0.0223	0.0109						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CU	APOS	0.0043	0.0027	-0.0091	0.005	25.	-9.2173	2.0600	F
	CCIW	0.0134	0.0043						
NI	APOS	0.0018	0.0018	0.0008	0.001	25.	2.8263	2.0600	F
	CCIW	0.0010	0.0008						
PB	APOS	0.0158	0.0089	0.0047	0.007	25.	3.4796	2.0600	F
	CCIW	0.0111	0.0055						
ZN	APOS	0.0142	0.0141	0.0033	0.016	25.	1.0833	2.0600	T
	CCIW	0.0108	0.0090						
AL		NO DATA PAIRS							
CO	APOS	0.0009	0.0020	0.0004	0.002	11.	0.7081	2.2010	T
	CCIW	0.0005	0.0005						
MN		NO DATA PAIRS							
V		NO DATA PAIRS							

APOS AND CCIW INTERCOMPARISON
PAIR-WISE T-TEST : SIGNIFICANCE LEVEL = .05

WET SAMPLING RESULTS :
UNITS - MG/L , UNLESS OTHERWISE NOTED

SUMMER OBSERVATIONS : MAY - OCTOBER

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
VOLUME (L)	APOS	1.431	0.638	0.0102	0.433	13.	0.0883	2.1600	T
	CCIW	1.920	0.662						
CON	APOS	43.960	14.174	-2.7757	7.681	13.	-1.3327	2.1600	T
	CCIW	46.636	16.013						
PH	APOS	4.168	0.332	0.1807	0.245	13.	2.7638	2.1600	F
	CCIW	3.987	0.183						
ACIDITY	APOS	6.218	2.073	1.6393	1.659	13.	3.6972	2.1600	F
	CCIW	4.579	2.197						
SO4	APOS	5.034	1.246	-0.1464	0.772	13.	-0.7095	2.1600	T
	CCIW	5.166	1.440						
N-NO3	APOS	0.666	0.276	-0.0603	0.177	13.	-1.2767	2.1600	T
	CCIW	0.727	0.391						
N-NH4	APOS	0.474	0.195	0.0673	0.173	13.	1.4548	2.1600	T
	CCIW	0.407	0.200						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CL	APOS	0.199	0.097	-0.1893	0.372	13.	-1.9021	2.1600	T
	CCIW	0.388	0.420						
CA	APOS	0.450	0.241	0.1086	0.123	13.	3.2936	2.1600	F
	CCIW	0.357	0.160						
K	APOS	0.061	0.040	-0.0379	0.095	13.	-1.4954	2.1600	T
	CCIW	0.099	0.090						
NA	APOS	0.058	0.044	-0.0350	0.082	13.	-1.5886	2.1600	T
	CCIW	0.093	0.080						
N-TKN	APOS	0.580	0.196	0.0015	0.159	13.	0.0352	2.1600	T
	CCIW	0.578	0.199						
TP	APOS	0.015	0.029	-0.0101	0.071	13.	-0.5348	2.1600	T
	CCIW	0.025	0.062						
MG	APOS	0.1021	0.0659	0.0421	0.059	13.	2.6731	2.1600	F
	CCIW	0.0600	0.0263						
FE	APOS	0.0684	0.0616	0.0487	0.062	13.	2.9550	2.1600	F
	CCIW	0.0196	0.0095						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CU	APOS	0.0040	0.0023	-0.0091	0.004	13.	-9.4158	2.1600	F
	CCIW	0.0131	0.0033						
NI	APOS	0.0011	0.0004	0.0004	0.000	13.	3.6799	2.1600	F
	CCIW	0.0008	0.0003						
PB	APOS	0.0149	0.0093	0.0045	0.004	13.	4.6712	2.1600	F
	CCIW	0.0104	0.0070						
ZN	APOS	0.0159	0.0187	0.0069	0.019	13.	1.3227	2.1600	T
	CCIW	0.0091	0.0041						
AL	NO DATA PAIRS								
CD	NO DATA PAIRS								
MN	NO DATA PAIRS								
V	NO DATA PAIRS								

APOS AND CCIW INTERCOMPARISON
PAIR-WISE T-TEST : SIGNIFICANCE LEVEL = .05

WET SAMPLING RESULTS :
UNITS - MG/L , UNLESS OTHERWISE NOTED

WINTER OBSERVATIONS : NOVEMBER - APRIL

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
VOLUME (L)	APOS	1.653	0.739	-0.1669	0.468	13.	-1.3338	2.1600	T
	CCIW	1.819	0.672						
CON	APOS	31.446	6.811	-3.6308	4.918	12.	-2.6618	2.1790	F
	CCIW	35.077	5.501						
PH	APOS	4.247	0.171	-0.1023	0.408	12.	-0.9045	2.1790	T
	CCIW	4.349	0.533						
ACIDITY	APOS	5.025	0.926	1.3250	1.256	9.	3.3369	2.2620	F
	CCIW	3.700	0.731						
SO4	APOS	3.046	0.371	0.2085	0.592	12.	1.2695	2.1790	T
	CCIW	2.838	0.493						
N-NO3	APOS	0.657	0.154	-0.0417	0.122	12.	-1.2366	2.1790	T
	CCIW	0.699	0.147						
N-NH4	APOS	0.443	0.153	0.0777	0.179	12.	1.5693	2.1790	T
	CCIW	0.365	0.237						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CL	APOS	0.293	0.146	-0.5569	0.896	12.	-2.2408	2.1790	F
	CCIW	0.850	0.897						
CA	APOS	0.290	0.166	-0.4069	0.673	12.	-2.1812	2.1790	F
	CCIW	0.697	0.628						
K	APOS	0.043	0.038	-0.2338	0.499	12.	-1.6913	2.1790	T
	CCIW	0.277	0.505						
NA	APOS	0.152	0.120	-0.1538	0.351	12.	-1.5794	2.1790	T
	CCIW	0.305	0.334						
N-TKN	APOS	0.602	0.215	0.0442	0.416	12.	0.3831	2.1790	T
	CCIW	0.557	0.478						
TP	APOS	0.015	0.024	0.0065	0.029	12.	0.8160	2.1790	T
	CCIW	0.009	0.013						
MG	APOS	0.0508	0.0398	-0.0200	0.067	12.	-1.0760	2.1790	T
	CCIW	0.0708	0.0696						
FE	APOS	0.0473	0.0218	0.0219	0.026	11.	2.9449	2.2010	F
	CCIW	0.0254	0.0119						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CU	APOS	0.0047	0.0031	-0.0091	0.006	11.	-4.8593	2.2010	F
	CCIW	0.0137	0.0055						
NI	APOS	0.0026	0.0025	0.0013	0.002	11.	2.2571	2.2010	F
	CCIW	0.0013	0.0011						
PB	APOS	0.0168	0.0087	0.0050	0.010	11.	1.7888	2.2010	T
	CCIW	0.0119	0.0033						
ZN	APOS	0.0121	0.0058	-0.0008	0.009	11.	-0.2816	2.2010	T
	CCIW	0.0128	0.0125						
AL		NO DATA PAIRS							
CD	APOS	0.0009	0.0020	0.0004	0.002	11.	0.7081	2.2010	T
	CCIW	0.0005	0.0005						
MN		NO DATA PAIRS							
V		NO DATA PAIRS							

Appendix 2-9

Intercomparision of GLPN (CCIW) and CANSAP Data

CCIW AND CANSAP INTERCOMPARISON
PAIR-WISE T-TEST : SIGNIFICANCE LEVEL = .05

WET SAMPLING RESULTS :
UNITS - MG/L , UNLESS OTHERWISE NOTED

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
VOLUME (L)	CCIW	1.659	0.584	-0.1248	0.224	17.	-2.3638	2.1100	F
	CANSAP	1.784	0.652						
CON	CCIW	42.717	10.320	2.9889	10.323	17.	1.2284	2.1100	T
	CANSAP	39.728	13.278						
PH	CCIW	4.057	0.155	-0.1606	0.171	16.	-3.8661	2.1200	F
	CANSAP	4.218	0.138						
ACIDITY	CCIW	4.236	1.194	0.7572	1.275	17.	2.5203	2.1100	F
	CANSAP	3.479	1.421						
SO4	CCIW	3.619	1.649	-0.0489	1.028	17.	-0.2017	2.1100	T
	CANSAP	3.668	1.952						
N-NO3	CCIW	0.723	0.232	0.0502	0.134	17.	1.5929	2.1100	T
	CANSAP	0.673	0.221						
N-NH4	CCIW	0.348	0.150	-0.0327	0.227	17.	-0.6118	2.1100	T
	CANSAP	0.380	0.251						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CL	CCIW	0.524	0.579	-0.3533	1.272	17.	-1.1782	2.1100	T
	CANSAP	0.878	1.091						
CA	CCIW	0.449	0.513	-0.0061	0.629	17.	-0.0412	2.1100	T
	CANSAP	0.455	0.294						
K	CCIW	0.066	0.041	-0.1022	0.191	17.	-2.2708	2.1100	F
	CANSAP	0.168	0.173						
NA	CCIW	0.166	0.193	-0.2928	0.445	17.	-2.7937	2.1100	F
	CANSAP	0.458	0.606						
N-TKN	NO DATA PAIRS								
TP	CCIW	0.005	0.004	-0.0245	0.051	17.	-2.0458	2.1100	T
	CANSAP	0.029	0.050						
MG	CCIW	0.0389	0.0160	-0.0289	0.052	17.	-2.3568	2.1100	F
	CANSAP	0.0678	0.0555						
FE	CCIW	0.0235	0.0109	0.0136	0.010	15.	5.2235	2.1310	F
	CANSAP	0.0099	0.0045						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CU	CCIW	0.0145	0.0051	0.0068	0.007	15.	3.9137	2.1310	F
	CANSAP	0.0076	0.0033						
NI	CCIW	0.0049	0.0113	0.0028	0.011	15.	1.0371	2.1310	T
	CANSAP	0.0021	0.0013						
PB	CCIW	0.0109	0.0033	-0.0012	0.004	15.	-1.2910	2.1310	T
	CANSAP	0.0121	0.0046						
ZN	CCIW	0.0076	0.0027	-0.0058	0.009	15.	-2.5424	2.1310	F
	CANSAP	0.0134	0.0090						
AL	NO DATA PAIRS								
CD	CCIW	0.0006	0.0005	-0.0017	0.002	15.	-2.9963	2.1310	F
	CANSAP	0.0022	0.0027						
MN	NO DATA PAIRS								
V	NO DATA PAIRS								

CCIW AND CANSAP INTERCOMPARISON
PAIR-WISE T-TEST : SIGNIFICANCE LEVEL = .05

WET SAMPLING RESULTS :
UNITS - MG/L , UNLESS OTHERWISE NOTED

SUMMER OBSERVATIONS : MAY - OCTOBER

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
VOLUME (L)	CCIW	1.849	0.397	-0.0887	0.189	5.	-1.1522	2.5710	T
	CANSAP	1.938	0.345						
CON	CCIW	51.467	6.131	-0.2000	12.506	5.	-0.0392	2.5710	T
	CANSAP	51.667	16.314						
PH	CCIW	3.884	0.047	-0.2960	0.195	4.	-3.3940	2.7760	F
	CANSAP	4.180	0.205						
ACIDITY	CCIW	5.067	0.916	0.6000	1.943	5.	0.7563	2.5710	T
	CANSAP	4.467	2.109						
SO4	CCIW	5.800	0.657	-0.1833	1.797	5.	-0.2499	2.5710	T
	CANSAP	5.983	1.695						
N-NO3	CCIW	0.820	0.324	0.1500	0.146	5.	2.5093	2.5710	T
	CANSAP	0.670	0.274						
N-NH4	CCIW	0.508	0.145	-0.0940	0.367	5.	-0.6282	2.5710	T
	CANSAP	0.602	0.315						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CL	CCIW	0.297	0.370	0.0933	0.370	5.	0.6178	2.5710	T
	CANSAP	0.203	0.084						
CA	CCIW	0.332	0.100	-0.1150	0.197	5.	-1.4295	2.5710	T
	CANSAP	0.447	0.242						
K	CCIW	0.070	0.028	-0.0650	0.173	5.	-0.9200	2.5710	T
	CANSAP	0.135	0.160						
NA	CCIW	0.067	0.049	-0.0267	0.067	5.	-0.9730	2.5710	T
	CANSAP	0.093	0.042						
N-TKN	NO DATA PAIRS								
TP	CCIW	0.005	0.003	-0.0430	0.087	5.	-1.2156	2.5710	T
	CANSAP	0.048	0.086						
MG	CCIW	0.0517	0.0147	-0.0617	0.082	5.	-1.8404	2.5710	T
	CANSAP	0.1133	0.0797						
FE	CCIW	0.0173	0.0078	0.0077	0.007	5.	2.5125	2.5710	T
	CANSAP	0.0097	0.0045						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CU	CCIW	0.0140	0.0031	0.0058	0.007	5.	2.0174	2.5710	T
	CANSAP	0.0082	0.0052						
NI	CCIW	0.0007	0.0003	-0.0001	0.000	5.	-0.5423	2.5710	T
	CANSAP	0.0008	0.0003						
PB	CCIW	0.0108	0.0045	-0.0015	0.003	5.	-1.3416	2.5710	T
	CANSAP	0.0123	0.0040						
ZN	CCIW	0.0078	0.0035	-0.0008	0.006	5.	-0.3432	2.5710	T
	CANSAP	0.0087	0.0052						
AL	NO DATA PAIRS								
CD	CCIW	0.0003	0.0003	-0.0007	0.000	5.	-6.6509	2.5710	F
	CANSAP	0.0010	0.0000						
MN	NO DATA PAIRS								
V	NO DATA PAIRS								

CCIW AND CANSAP INTERCOMPARISON
PAIR-WISE T-TEST : SIGNIFICANCE LEVEL = .05

WET SAMPLING RESULTS :
UNITS - MG/L , UNLESS OTHERWISE NOTED

WINTER OBSERVATIONS : NOVEMBER - APRIL

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	*	MEAN DIFFERENCE	STANDARD DEVIATION	*	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
VOLUME (L)	CCIW	1.564	0.653	*	-0.1429	0.246	*	11.	-2.0151	2.2010	T
	CANSAP	1.707	0.764	*							
CON	CCIW	38.342	9.212	*	4.5833	9.235	*	11.	1.7193	2.2010	T
	CANSAP	33.758	5.905	*							
PH	CCIW	4.129	0.121	*	-0.1042	0.130	*	11.	-2.7654	2.2010	F
	CANSAP	4.233	0.107	*							
ACIDITY	CCIW	3.821	1.121	*	0.8358	0.880	*	11.	3.2898	2.2010	F
	CANSAP	2.985	0.550	*							
SO4	CCIW	2.529	0.343	*	0.0183	0.390	*	11.	0.1629	2.2010	T
	CANSAP	2.511	0.447	*							
N-NO3	CCIW	0.674	0.167	*	0.0003	0.099	*	11.	0.0117	2.2010	T
	CANSAP	0.674	0.204	*							
N-NH4	CCIW	0.268	0.066	*	-0.0020	0.123	*	11.	-0.0563	2.2010	T
	CANSAP	0.270	0.110	*							

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CL	CCIW	0.638	0.643	-0.5767	1.509	11.	-1.3240	2.2010	T
	CANSAP	1.215	1.210						
CA	CCIW	0.507	0.625	0.0483	0.765	11.	0.2189	2.2010	T
	CANSAP	0.459	0.333						
K	CCIW	0.064	0.048	-0.1208	0.204	11.	-2.0516	2.2010	T
	CANSAP	0.185	0.183						
NA	CCIW	0.215	0.220	-0.4258	0.496	11.	-2.9770	2.2010	F
	CANSAP	0.641	0.676						
N-TKN	NO DATA PAIRS								
TP	CCIW	0.004	0.004	-0.0152	0.017	11.	-3.0657	2.2010	F
	CANSAP	0.020	0.015						
MG	CCIW	0.0325	0.0129	-0.0125	0.015	11.	-2.8031	2.2010	F
	CANSAP	0.0450	0.0131						
FE	CCIW	0.0272	0.0112	0.0171	0.011	9.	5.1175	2.2620	F
	CANSAP	0.0101	0.0048						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CU	CCIW	0.0147	0.0061	0.0074	0.007	9.	3.2489	2.2620	F
	CANSAP	0.0073	0.0018						
NI	CCIW	0.0074	0.0134	0.0045	0.014	9.	1.0520	2.2620	T
	CANSAP	0.0029	0.0010						
PB	CCIW	0.0109	0.0026	-0.0011	0.005	9.	-0.7633	2.2620	T
	CANSAP	0.0120	0.0051						
ZN	CCIW	0.0075	0.0022	-0.0088	0.010	9.	-2.8812	2.2620	F
	CANSAP	0.0163	0.0097						
AL	NO DATA PAIRS								
CD	CCIW	0.0007	0.0006	-0.0023	0.003	9.	-2.6391	2.2620	F
	CANSAP	0.0030	0.0032						
MN	NO DATA PAIRS								
V	NO DATA PAIRS								

CCIW AND CANSAP INTERCOMPARISON
PAIR-WISE T-TEST : SIGNIFICANCE LEVEL = .05

WET SAMPLING RESULTS :
UNITS - MG/L , UNLESS OTHERWISE NOTED

PERIOD : MAY - DEC, 1979

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
VOLUME (L)	CCIW	1.713	0.443	-0.1260	0.208	9.	-1.9124	2.2620	T
	CANSAP	1.839	0.492						
CON	CCIW	44.490	10.715	-0.0500	9.437	9.	-0.0168	2.2620	T
	CANSAP	44.540	15.812						
PH	CCIW	4.003	0.168	-0.1522	0.223	8.	-2.0480	2.3060	T
	CANSAP	4.156	0.159						
ACIDITY	CCIW	4.545	1.072	0.6330	1.465	9.	1.3667	2.2620	T
	CANSAP	3.912	1.791						
SO4	CCIW	4.399	1.877	-0.1610	1.390	9.	-0.3662	2.2620	T
	CANSAP	4.560	2.270						
N-NO3	CCIW	0.782	0.263	0.0872	0.144	9.	1.9155	2.2620	T
	CANSAP	0.695	0.231						
N-NH4	CCIW	0.399	0.188	-0.0834	0.284	9.	-0.9294	2.2620	T
	CANSAP	0.482	0.282						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CL	CCIW	0.391	0.375	0.1080	0.505	9.	0.6761	2.2620	T
	CANSAP	0.283	0.275						
CA	CCIW	0.569	0.677	-0.0040	0.857	9.	-0.0148	2.2620	T
	CANSAP	0.573	0.356						
K	CCIW	0.058	0.027	-0.0730	0.140	9.	-1.6470	2.2620	T
	CANSAP	0.131	0.130						
NA	CCIW	0.098	0.078	-0.1140	0.225	9.	-1.6054	2.2620	T
	CANSAP	0.212	0.217						
N-TKN	NO DATA PAIRS								
TP	CCIW	0.005	0.004	-0.0304	0.067	9.	-1.4299	2.2620	T
	CANSAP	0.036	0.066						
MG	CCIW	0.0450	0.0172	-0.0430	0.067	9.	-2.0343	2.2620	T
	CANSAP	0.0880	0.0686						
FE	CCIW	0.0227	0.0114	0.0115	0.010	9.	3.6642	2.2620	F
	CANSAP	0.0112	0.0051						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CU	CCIW	0.0156	0.0055	0.0081	0.008	9.	3.2585	2.2620	F
	CANSAP	0.0075	0.0041						
NI	CCIW	0.0067	0.0142	0.0049	0.013	9.	1.1511	2.2620	T
	CANSAP	0.0018	0.0015						
PB	CCIW	0.0114	0.0037	-0.0019	0.005	9.	-1.2592	2.2620	T
	CANSAP	0.0133	0.0053						
ZN	CCIW	0.0079	0.0029	-0.0042	0.011	9.	-1.2183	2.2620	T
	CANSAP	0.0121	0.0107						
AL	NO DATA PAIRS								
CD	CCIW	0.0006	0.0007	-0.0022	0.003	9.	-2.5616	2.2620	F
	CANSAP	0.0028	0.0033						
MN	NO DATA PAIRS								
V	NO DATA PAIRS								

CCIW AND CANSAP INTERCOMPARISON
PAIR-WISE T-TEST : SIGNIFICANCE LEVEL = .05

WET SAMPLING RESULTS :
UNITS - MG/L , UNLESS OTHERWISE NOTED

PERIOD : JAN - APR, 1980

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
VOLUME (L)	CCIW	1.592	0.753	-0.1234	0.257	7.	-1.3573	2.3650	T
	CANSAP	1.715	0.844						
CON	CCIW	40.500	10.046	6.7875	10.706	7.	1.7933	2.3650	T
	CANSAP	33.712	5.681						
PH	CCIW	4.117	0.120	-0.1700	0.100	7.	-4.8015	2.3650	F
	CANSAP	4.287	0.064						
ACIDITY	CCIW	3.850	1.295	0.9125	1.067	7.	2.4190	2.3650	F
	CANSAP	2.937	0.424						
SO4	CCIW	2.645	0.351	0.0912	0.210	7.	1.2306	2.3650	T
	CANSAP	2.554	0.279						
N-NO3	CCIW	0.649	0.176	0.0040	0.111	7.	0.1015	2.3650	T
	CANSAP	0.645	0.221						
N-NH4	CCIW	0.283	0.028	0.0308	0.113	7.	0.7681	2.3650	T
	CANSAP	0.253	0.132						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CL	CCIW	0.691	0.759	-0.9300	1.709	7.	-1.5396	2.3650	T
	CANSAP	1.621	1.288						
CA	CCIW	0.299	0.052	-0.0087	0.130	7.	-0.1897	2.3650	T
	CANSAP	0.307	0.093						
K	CCIW	0.076	0.054	-0.1387	0.246	7.	-1.5944	2.3650	T
	CANSAP	0.215	0.215						
NA	CCIW	0.250	0.260	-0.5162	0.559	7.	-2.6119	2.3650	F
	CANSAP	0.766	0.797						
N-TKN	NO DATA PAIRS								
TP	CCIW	0.004	0.003	-0.0171	0.019	7.	-2.6046	2.3650	F
	CANSAP	0.021	0.018						
MG	CCIW	0.0312	0.0113	-0.0112	0.014	7.	-2.3462	2.3650	T
	CANSAP	0.0425	0.0104						
FE	CCIW	0.0248	0.0110	0.0170	0.011	5.	3.7435	2.5710	F
	CANSAP	0.0078	0.0024						

ELEMENT	NETWORK	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	STANDARD DEVIATION	DEGREES OF FREEDOM	TEST STATISTIC	PERCENTILE OF T-DIST.	NULL HYPOTHESIS U1=U2 T-ACCEPT H. F-REJECT H.
CU	CCIW	0.0125	0.0040	0.0047	0.005	5.	2.2831	2.5710	T
	CANSAP	0.0078	0.0017						
NI	CCIW	0.0020	0.0014	-0.0007	0.002	5.	-0.8647	2.5710	T
	CANSAP	0.0027	0.0008						
PB	CCIW	0.0100	0.0025	-0.0002	0.001	5.	-0.3071	2.5710	T
	CANSAP	0.0102	0.0026						
ZN	CCIW	0.0072	0.0024	-0.0085	0.005	5.	-4.3320	2.5710	F
	CANSAP	0.0157	0.0049						
AL	NO DATA PAIRS								
CD	CCIW	0.0005	0.0003	-0.0008	0.001	5.	-3.4223	2.5710	F
	CANSAP	0.0013	0.0005						
MN	NO DATA PAIRS								
V	NO DATA PAIRS								